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COMPUTERWORLD

FOCUS

Micro strategies unfold

Beyond hype
PS/2 buying
Power of use
PC graphics'
Special Secti

PCs alter business vision

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Circle Reader Service Number 1

in focus

HIGH-TECH HORIZONS

What does the future hold for personal computer technology? The answer to this question can be found in many a research and development laboratory. Technologies are being readied for the desktop that may provide users with the power of mainframes or even supercomputers. Find out the areas to watch for PC progress. By Michael Tucker. Page 16.

BEYOND THE HYPERTEXT HYPE

A short while ago, only the most leading-edge industry gurus discussed the concept of hypertext. But Apple's much-publicized introduction of Hypercard, a hypertext-based product, has brought discussion of the concept into the mainstream. Yet many say they are finding it hard to separate hypertext myth from reality. Find out what hypertext is, the products that are being offered and why they are useful. By Rebecca Hurst. Page 19.

THE PS/2 DILEMMA

MIS directors interviewed agree that the move to the PS/2 is inevitable but not immediate. Questions about the machine's price/performance, its lack of operating system and applications and its connectivity claims are making concerned managers hang on to current technology a little longer and place the PS/2 in their long-term plans. By Philip J. Gill. Page 21.

PC graphics' new image

By Rebecca Hurst. Desktop presentation graphics have come a long way since their first appearance, improved by advances in technology and desktop publishing. No longer considered merely adjuncts to business presentations, quality graphics have become a must for strategic-minded organizations. Read about the strides that have been made in PC graphics. Page 27.

A cooperative effort

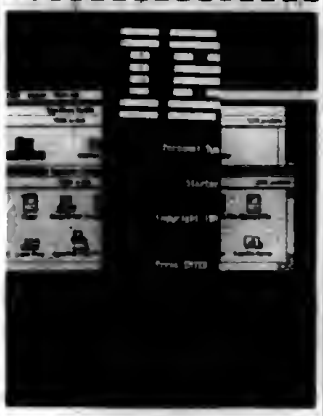
By Ross Altman. Cooperative processing, or using PCs and mainframes to share the processing of production applications, is the latest phase in what many see as the continuing decentralization of corporate computing. The author looks at two approaches that provide this type of processing — distributed data and distributed function — to help you decide if either is a viable alternative for your company. Page 37.

Catering to users groups

By Stan Kolodziej. Users groups have for many years influenced vendor products and policies to one extent or another. Companies say they see these groups as a slice of corporate life, representing what users all over the U.S. want from their vendors. But how powerful and effective are these organizations in getting their voices heard? Take an inside look at today's users groups and the clout they wield. Page 41.

COVER BY TERRY ALLEN

SPECIAL SECTION



Connectivity

IBM and Apple are scrambling to make more connectivity features available for the PS/2 and Mac lines but for different reasons. Apple is being pragmatic; connectivity to IBM and DEC will give it entry into the corporate world. IBM is looking out for No. 1; connectivity under SAA may serve to make it the all-encompassing force in the office. Senior Editor Stan Kolodziej's analysis begins on page 31.

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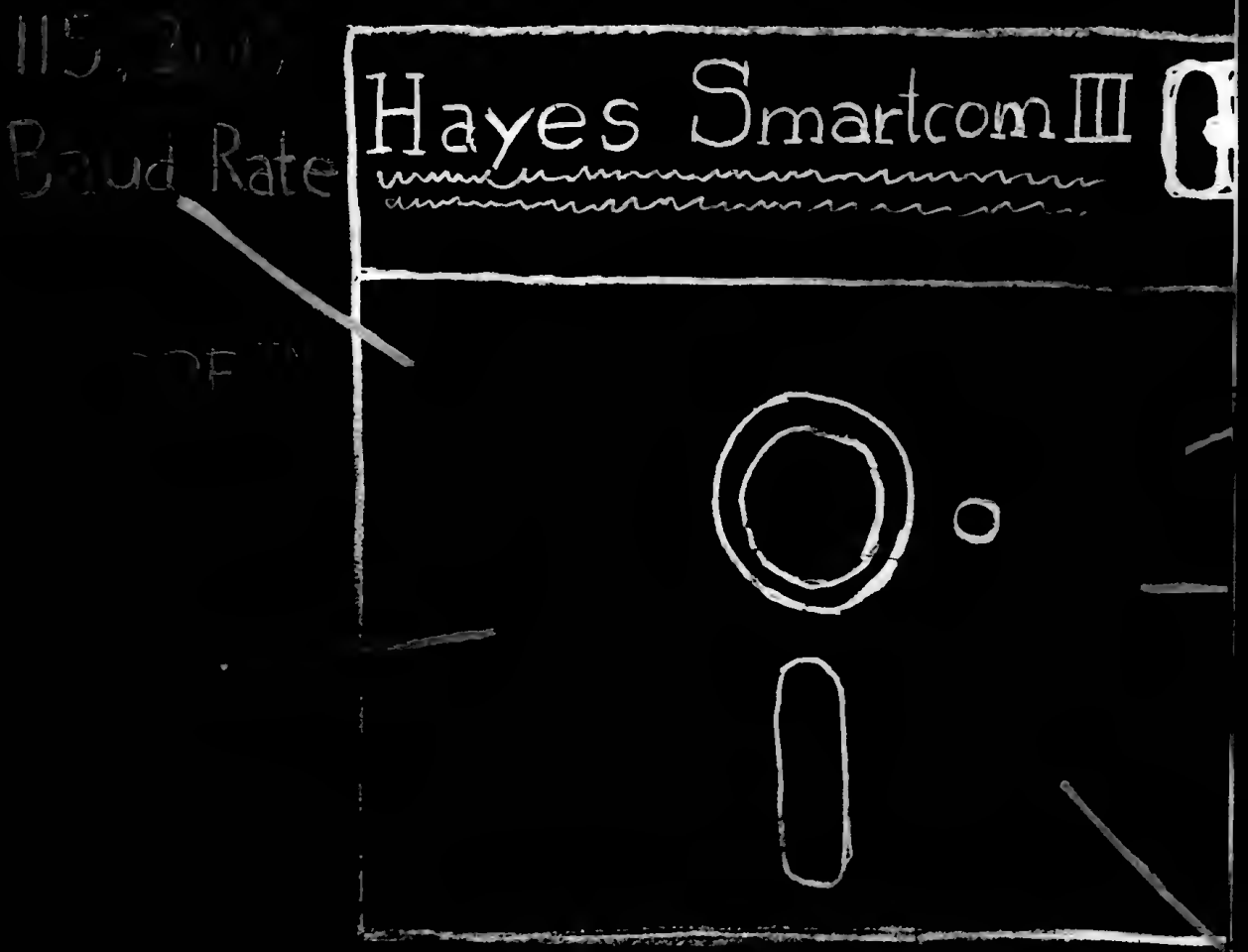
THIS TIME WE OUTSMARTED



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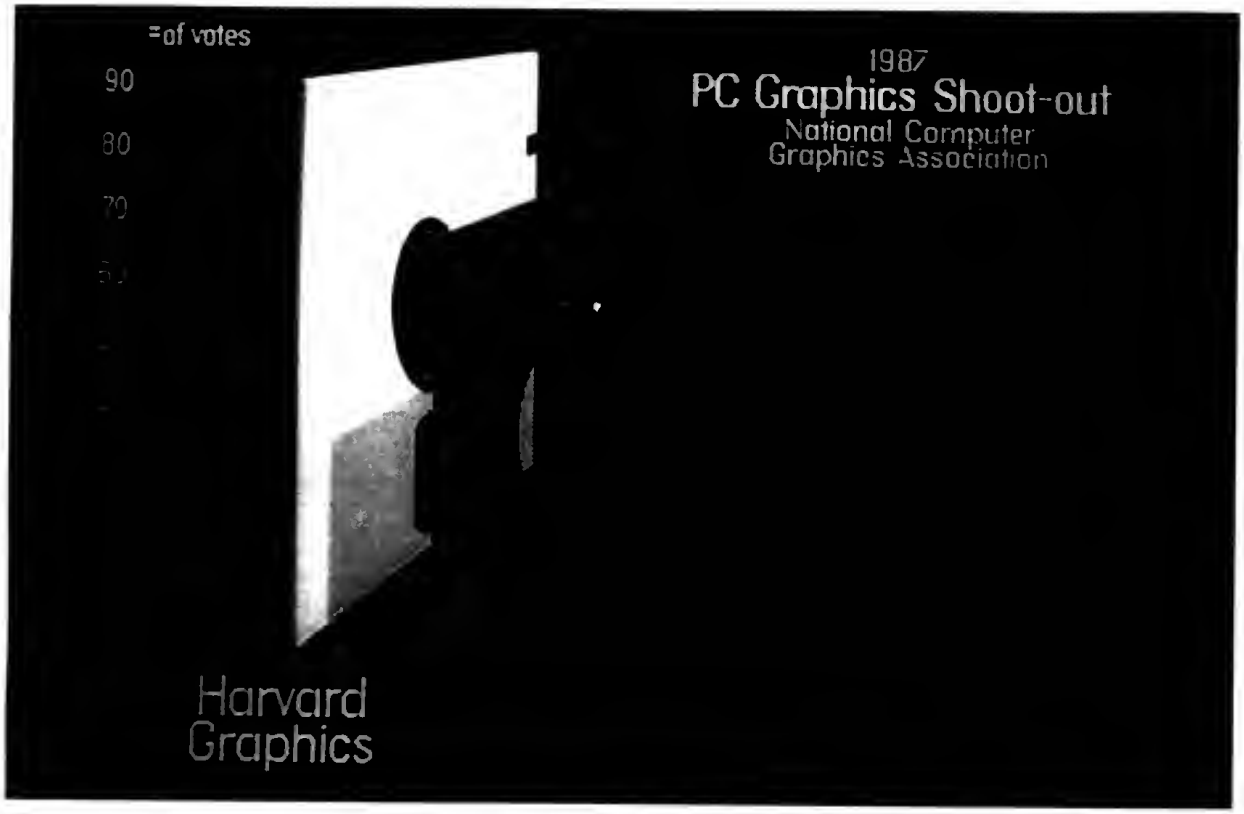

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FROM THE EDITOR

Chess, anyone?

Can Compaq Computer Corp. expect long-term success from its continuing battle with IBM's technology and new product line? The David and Goliath contest has so far gone in favor of Compaq, a Houston-based upstart that has been a thorn in IBM's side since it introduced its first IBM-compatible personal computer in 1982. Since then, Compaq has aggressively attempted to lead the market away from a strictly IBM personal computer line.

In effect, a chess game has been ensuing between the two companies. Instead of following IBM's lead, Compaq introduced an Intel Corp. 386-based PC ahead of IBM. Rather than offering a compatible product with added benefits, it broke away from its traditional game and tried a gambit of its own. In return, IBM did the unexpected and, instead of coming out with only a 386 machine, introduced the Personal System/2 line.

Compaq is following its own road. The recent introduction of its Deskpro 386/20 and the 20-MHz 80386-based Compaq Portable is another loud proclamation of independence from IBM and the new PS/2 standard. The reported speed and performance of the Compaq products may help increase its lead in the 386 market. But what are the benefits of having a second standard instead of following IBM's? Compaq is emphatic in claiming that the original IBM-based PC architecture will continue to be a standard. Vendors' upgrades and enhancements will undoubtedly keep its functionality rich and useful. And few can argue with Compaq's strategy to date; its second-quarter sales this year rose 84% over a year ago, even with IBM's PS/2 introduction.

But it would be foolish to underestimate the power of IBM and its PS/2. IBM maintains that orders are strong, and MIS corporate buyers are reportedly experimenting with the line. IBM's sales have dropped in the last few years but that may be attributed to buyer confusion about its expected PS/2 announcement. Now that those products are available, a turnaround may occur.

While these two vendors play out their separate strategies, MIS must assess its position. Are two standards better than one? Will two choices provide flexibility and viable alternatives or confusion and connectivity problems? MIS needs to devise its own strategy, regardless of the games the two vendors play.

Ann Dooley

Soviet journalist decries information's quality at expo

During July, about 100,000 Muscovites saw the effect of the technological revolution on the U.S. by visiting an exhibition in Moscow called "Information USA." The technology exhibition, organized by the U.S. Information Agency, was held in the Soviet Union to keep with an agreement between the Soviet and U.S. governments. The pact, signed in Geneva, was formed to ensure that the two countries would stay in contact in the fields of science, technology, education and culture. The exhibition will remain in the Soviet Union for 18 months, touring the country's nine major cities. It is full of electronic glamour: personal computers, printers, microprocessors, satellite communications systems and so on.

The subject that immediately catches one's attention, however, is the talk about the free flow of information. It comes from bright posters and stands. The idea was also emphasized by U.S. Information Agency Director Charles Wick at the opening ceremony and was repeated in President Ronald Reagan's televised address to the attendees.

Yet for all the words, there was an obvious shortage of true free exchange of engineering and technical ideas at the exhibition. The computers displayed could hardly be described as the latest advances in science and technology.

As soon as I looked at the products of such manufacturers as Apple Computer, Inc., Atari Corp. and IBM, I got the impression that instead of an exhibition of the electronic might of one of the world's great powers, I had somehow strayed into a toy shop. And the exhibition guides, too, found it difficult to answer fairly simple questions dealing with, say, computer software, trying instead to sidetrack the discussion to such comfortable issues as how long one must work in the U.S. to be able to buy a car.

So why do Americans think that "those Russians" can be shown second-grade stuff?

True, in terms of the general standard of computerization, we are still behind the Western nations, but that gap is getting narrower. In particular, between now and 1990, Soviet industry is planning to develop and phase in new-generation computers of all classes, from supercomputers to personal computers. The overall output of computers during that period is expected to increase 2.3 times. Already, 9th and 10th grade pupils at all general-education schools are studying a new subject — information science and computer technology — which teaches them programming basics. A course called "Computer Equipment in Engineering and Economic Calculations" is being introduced at many higher schools.

These are extensive plans, and to speed them up, we are prepared to cooperate with Western computer firms, including those from the U.S.

One often hears that such coöperation is a one-way street and that the Soviets are just seeking to lay their hands on Western high technology. One would be unwise, however, to underestimate the technical capabilities and the creative potential of Soviet science. For example, engineers from the Moscow Institute of Electronic Controlling Machines have designed a processor that can perform 1.06 billion operations per second and that is meant for designing large integrated circuits. Experts from the Computer Center of the Siberian Division of the U.S.S.R. Academy of Sciences are completing the development of a fifth-generation Mars computer, a 32-register multiprocessor machine. Furthermore, the S. A. Lebedev Institute of Precision Mechanism and Computer

Continued on page 10

VIEWPOINT

COMMENTARY

Mainframe dinosaurs

William Zachmann

Are mainframes obsolete? Is the current period of slow growth in mainframe computer sales just a temporary pause or the beginning of an era of decline? The fate of the entire industry and major companies hangs on the answers to such queries.

Until recently, even to raise such questions was considered crazy. Data processing professionals seem to believe the situation will be "business as usual" for a long time.

However, there is growing uncertainty about whether something momentous may be occurring. As the most dyed-in-the-wool DP types begin to see what others are doing with personal computers and other microprocessor based-systems, a ripple of doubt will pass over MIS land.

And for good reason. Mainframes are headed the way of the horse and buggy and steam locomotive. These machines are roughly in the same position that the dinosaurs were 65 million years ago when a large meteorite supposedly slammed into the earth, altering the climate.

The evolution of the second generation of information systems is creating an industry climate as inhospitable to traditional mainframe systems as the earth's cooler and dryer climate was to the dinosaurs. Traditional mainframe systems will not disappear overnight, but they are an endangered and probably doomed species.

The emerging second generation of information systems will be radically different from the first. The first generation of information systems has been dominated by proprietary mainframe and, later, minicomputer, architectures unique to individual vendors. The second generation will be dominated by standardized microprocessor architectures, standard operating systems and standard networking interfaces.

Traditional computer and terminal architectures will give way to distributed resource system architectures based on a multiplicity of workstations and servers linked by high-speed, fully connective peer-to-peer networks. The control that traditional vendors have enjoyed over their installed bases will be replaced by a highly competitive market for increasingly interchangeable and standardized hardware and software components.

In the process, the proportion of information processing work done on smaller, microprocessor-based workstations and servers will grow dramatically. Mainframe share of processing — and mainframe market share — will plummet during the 1990s. Traditional applications written in Cobol with data bases like IBM IMS on mainframes will give way to applications written either in high-level macro applications languages or in C on workstations accessing arrays of IBM SQL data base servers. Individual applications will give way to hardware and software environments that provide end users with the ability to create their own applications as they need them.

The impending obsolescence of the mainframe does not mean that large systems will vanish. Large data bases requiring great amounts of storage, big applications requiring extremely fast processors and huge communications environments are not going to disappear. However, to meet large systems needs, vendors will develop specialized, large, high-capacity data base servers; multiprocessor vector, array, data-flow or neural network computational servers; and communications servers. The majority of these units will be based on standard microprocessors and will all but replace general-purpose mainframe systems by the end of the 1990s.

Mainframes will not decline simply because of microprocessor-based technologies, local-area networks, network/server architectures and so forth. Rather, it is the economics of the transition to second-generation information systems that will provide the dynamic of change.

One million 32-bit instructions per second (MIPS) on a traditional mainframe system costs more than $100,000 today. A nearly comparable MIPS performance on a microprocessor-based system is currently priced at as little as $1,000. This 100-to-1 difference in price for what amounts to an equivalent performance is what will sway the industry.

Such turmoil will be upon us during the next few years. The economic potential of microprocessor-based systems will devastate the demand for, price of and survivability of traditional mainframe systems and the vendors who depend on them for their revenues.

Zachmann is vice-president of research at Framingham, Mass.-based International Data Corp.

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VIEWPOINT

COMMENTARY

Circa 1990

Dennis Farley & David Nickolich

The next three to five years will bring enormous change to the working environment of programmer/analysts in both the skills they will need and the tools they will use. Examining the current trends in hardware and software should help predict and explain these changes and their impact on these computer industry professionals.

The most obvious and significant hardware trend is the ever-expanding capacity and power of the personal computer. The current generation of PCs offers the processing speed and capacity of an IBM 370/168 at a fraction of the cost; the Model 168 costs $3.4 million while the IBM Personal System/2 Model 80 with similar million of instructions per second (MIPS) power is approximately $11,000.

The availability of desktop MIPS and the move to provide unlimited storage for the PC will make the intelligent workstation the preferred tool for use by knowledge workers. Programmers and end users will use similar tools to assist them in their daily tasks.

With the proliferation of desktop power and storage for each individual, the trend to connect the computers in a corporation will accelerate. The programmer of the future will have an Integrated Services Digital Network and will use equipment manufactured to the international connectivity standards.

Although hardware issues definitely will affect the work of the programmer/analyst, software advances will be much more significant. Computer-aided software (or system) engineering (CASE) will find widespread use during the next few years. Tools for analysis and design — many of them PC based — will continue to improve in functionality, ease of use and power. Programmer/analysts will be working with application generation software. Working with users, the systems analysts will jointly develop system specifications, prototypes and data definitions under the control of system generation software. Once the system's specifications are built, they can generate error-free code.

Once constructed, the system will be highly flexible — allowing different life cycle methodologies, generating different languages or versions of languages for differing file access systems — and will be controlled by powerful dictionaries. These generators will also build bridges to all existing application software.

Reusable code techniques will be used under the control of software systems. Graphics and text processors will become a key part of the programmer/analyst's documentation tool kit.

With the American National Standards Institute spearheading the standards movement, standard interfaces between multivendor products will be defined.

Programmers will need to be familiar with the techniques of building expert systems and integrating them into standard software systems. Analysts will be using relational data base technology to create data repositories.

To address these changes in hardware and software, programmer/analysts need to develop new skills.

Using expert system shell languages and being able to build powerful expert systems from scratch will be a necessary skill. Traditional data base design must be updated to reflect the influence of relational systems. With a renewed emphasis on data, all programmer/analysts will require a strong background in data analysis and data-driven design techniques. Because data bases of the future will likely be accessible by IBM SQL, people will need to know and understand this language.

As software productivity aids become increasingly important, programmers must learn these complex packages to do their jobs. And the increased emphasis on the front-end skills of analysis and design demand that all programmer/analysts possess these essential skills. Knowing how to use CASE tools will be critical, as will the ability to interface with users.

As the software tools of tomorrow become more sophisticated and powerful, we need to foster specialization among certain tools because it will become even more difficult to learn in-depth about all new products. In the short term, firms must carefully weigh their choice of products. Retraining and switching from one software development environment to another is expensive. However, in the long term, it may become much easier to switch products because of the drive toward standard software interfaces.

By form-fitting today's trends to your firm's environment, you can help programmer/analysts plan for the skills that will guarantee future corporate success.

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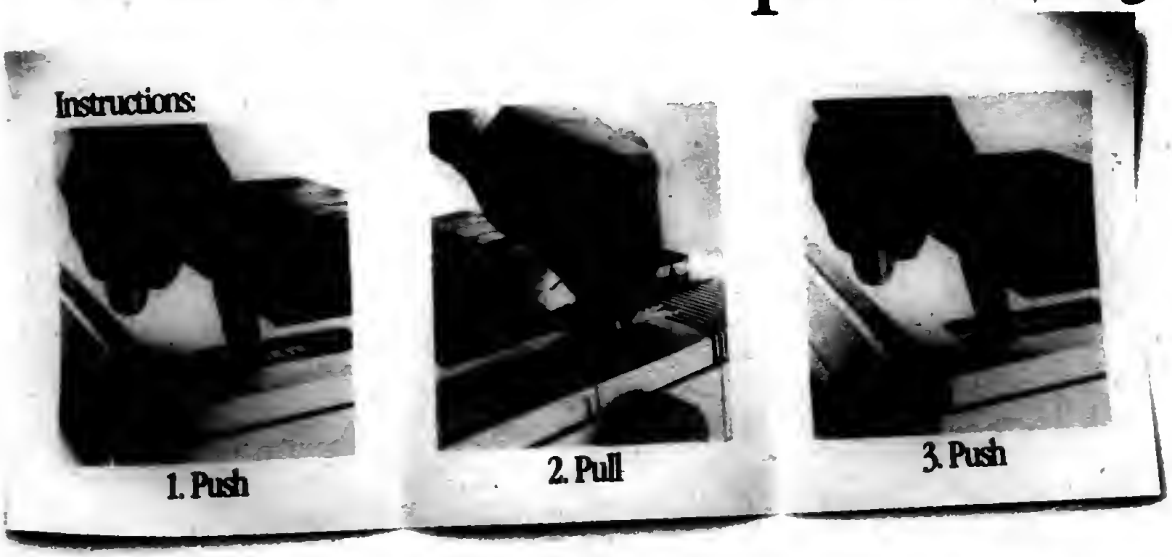

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Q AND A

Jon David

Battling mediocrity: Micro consultant urges stringent testing, security measures

Jon David is a computer consultant based in Tappan, N.Y., who has worked with microprocessors since 1970. Before becoming a consultant, David held senior positions with ITT, General Precision and RCA Corp. A lecturer and author, he was founder and first chairman of the Association for Computing Machinery's minicomputer subgroup and is currently head of the security subgroup for NYPC, the New York Personal Computer users group.

David recently spoke with *Computerworld Focus* Senior Editor Stan Kolodziej about software testing and security concerns in the PC market.

You stated that part of your consulting business involves computer software testing. Do you feel PC software developers do enough prerelease testing of their products?
Testing should take up *at least* one-third of the total development time. That means if you think that something is going to take you a year to develop, you should probably allow six months for testing.

Nobody does that, which is why you have problems showing up three or six months after a product appears. True, thorough testing is probably impossible because the permutations are infinite, but most software developers are still not extensive enough in their testing. They don't budget the time. If they have scheduled a year to develop something, it always takes 15 or 16 months. All of a sudden, they're late. So what do they cut back on? The test stage. They throw some minor tests at a program. If it works, great. Then they throw it into the field.

Are beta sites adequate for testing?
Beta sites are a lazy man's way to test. What happens is that if you're not going to do the testing yourself, clear your conscience, alert your customers and let them do the testing for you.

But I thought beta testing was supposed to provide a piece of the real world. Can you do that without beta testing?
Sure you can. You can go and do very thorough, real-world testing in a laboratory environment. All you need is the data, not the people. You're not going to call Kelly Services, for example, and say, "Hey, give me three operators, then give them a half-hour of training on the program while you log their human errors."

What you can do instead is simulate human beings. Techniques, for example, have been used in testing for years to introduce random errors and given probabilities. You just have to be alert to the types of problems that can happen.

Do you see product testing becoming even more lax because of competitive pressures to get products to market faster?
I think one of the problems is that people don't know how to test. Testing is a science. I think computing is an art, not a science. You just can't go and throw a few correct numbers into the machine, even in volume, and see if the machine is going to work.

Beta testing should be an addition to thorough lab testing, not a substitute for it.

Why hasn't there been a backlash from users?
Why don't people complain that the sun rises in the east? Because it's always been that way.

If you get a new car, for example, and every time you bought a new car you had to take it back within the first six months to get something fixed, you might be peeved. But if it happened to everybody, and it's always happened to you, you put up with it.

What's your alternative [to problem software]? Develop your own operating system, your own high-level languages, your own data base management systems, your own word processors? Of course not.

There has to be some reaction to these constant software flaws, at least from the large corporate customers.
The Citibanks and the Mobil Oils have clout, but they are used to this. It's inconvenient, but if they're experiencing [troubles with a software package], they know their competitors are, too.

So what are companies concerned about? Is security a big issue?
Security is becoming a big concern, it's just not becoming a big budget item. It's like insurance. I pay a lot for collision insurance on my car. I had an accident last January and trashed my car. While I was getting it fixed, I was without another car. For something like only two dollars a year, I could have had a rider on my insurance policy that provided me with a rental car while the other one was being fixed. Just for two dollars.

It's the same with PC security. You can intellectualize about it, see the benefits from it, but it usually takes an incident, a jolt, to move you into action. That's human nature.

So PC security is now considered more vital.
Yes. Everything that applies to mainframe security should also apply to PC security because PCs are on longer batch systems, no longer stand-alone; they are multiuser, networked systems.

PC security has become such an issue that IBM has even built password security features into the read-only memory BIOS of its Personal System/2 micros. Microsoft Corp. is also supposedly building software security into the OS/2 operating system [it is co-developing with IBM]. I don't know what Microsoft is doing, exactly, but [Microsoft Chairman] Bill Gates addressed NYPC recently and told us that file and record locking are being included in OS/2.

You have the break-ins and data integrity and all the other concerns with the mainframe now applying to PCs, except for one thing: It's not easy to walk away with a big mainframe disk pack, but you can walk away with PC programs and data on the 5¼-in. disks and, especially, on the 3½-in. disks. Always be suspicious of a fliptop [cigarette] box in the pocket of a guy who doesn't smoke. That's David's law.

MANAGER'S CORNER

Ways to win top brass backing

Jim Young

Some MIS managers see only two sides in dealing with executives.

One side is working with executives that do not care to get involved in information systems activity. These executives do not see information systems as a priority, they do not understand it and, perhaps, they have no affinity for information systems people, including the MIS manager.

The other side is dealing with executives that take an intensely critical interest in the information systems function and all the actions of the MIS department and manager. These executives are dissatisfied, distrust information systems and are fiercely determined to "correct the problem."

Having these two scenarios in mind, there is little wonder that MIS managers are reluctant to face top management.

But feeling that these are the only two choices when dealing with executives is ignorant of the following facts:

- There is a desirable middle ground where executives participate constructively.
- MIS managers determine by their actions how executives will work with the MIS department.
- MIS managers can take steps to ensure a positive relationship.

To change a negative relationship to a positive one, MIS managers must realize that executive participation is not only desirable but essential. By overlooking the strategic input and tactical guidance that executives can provide reveals a significant lack of business perspective on the part of the MIS manager. Besides, executives have a right to offer guidance and get input on the status of a company's information systems because they are key users.

However, MIS managers should not have unrealistic expectations of their relationship with top executives, hoping for inappropriately high levels of guidance and detail, offering mountains of petty facts as input and operating with confusion and uncertainty about executive needs.

These actions will quickly turn off executives, and the distance created between MIS and top management will become a business tragedy. Not only are technical resources poorly deployed in the absence of teamwork, but the MIS manager is also no longer in a position to contribute an information systems perspective to business problems.

Recognizing these possibilities should motivate the manager to strengthen his tenuous relationship to the executive group. The MIS manager must establish a constructive information systems role for executives and also gain an appropriate level of business participation for himself.

The following are ways in which information systems and top management can work together to achieve corporate goals:

Receiving executive guidance. Whether it is to determine project selections or establish technical strategies, executive direction is most efficiently received through formal programs. The MIS manager should take the initiative to establish such programs. If programs are in place, it may be time to recreate or reinforce the process. Too often, companies have procedures that are vague in establishing levels of support or selecting strategic direction.

Establishing steering committees. An executive group can be established to review major departmental directions and strategic requests. This process goes on all year long and brings executives closer to the MIS department's strengths and weaknesses.

Taking part in the information systems planning processes. Executives can effectively participate in an annual process to set objectives for the upcoming years, construct information systems strategies, establish priorities and possibly recommend resource levels. Techniques like high-level applications portfolio planning or high-level data analysis and modeling are tools that can assist in the consensus process and also introduce the executive to important information systems concepts.

Planning functional information systems budgets. This method does not have the benefit of an executive group process because each functional executive acts independently in budgeting those information systems resources his department plans to use.

Functional budgets make up, or at least contribute toward, the total company information systems departmental budget. This process is frequently coupled with a chargeback technique so that executives can monitor information systems performance against plan.

Instituting tactical processes. Executives can become

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Young is managing director of MIS for the Wheeler Group, a division of Pitney Bowes, Inc. in Hartford, Conn.

Manager's corner

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involved in tactical decisions as necessary. A popular vehicle for information systems managers who are part of executive staffs is the periodic staff meeting. Here, the group can discuss business issues, and MIS can solicit executive guidance to improve the quality of impending decisions as well as give executives a sense of participation.

Providing input to executives. Whether delivered in a meeting or in a distributed report, executives should be updated on the status of various areas of information systems, such as the following:

- Resource use. Identifying and tracking how and where MIS resources are being used provides facts to executives to help them make business decisions.
- Benefit assessment. It is not enough to show how the company is using critical resources. MIS must identify and measure the results of past commitments to technology. The MIS manager can fulfill a valuable need by quantifying the payback from information systems investments.
- Allocation reporting. Each executive needs to be aware of the specific uses of information systems within his department. A good report will explain variations and discrepancies.

Educating executives. Supplementing information systems use data with briefings on broader topics is important.

Revealing the company's information systems orientation. To enable executives to make knowledgeable decisions, top management needs to be fully informed and oriented on how the company's operational systems function. The MIS manager can provide this education and, in doing so, showcase information system's ability to identify business relevance in systems details.

Pinpointing technical trends. The executive need for computer literacy is largely passe. However, as technology evolves, the MIS manager can fill a fundamental need by not only informing executives of relevant developments but providing appropriate interpretations as well.

Reporting how a product or service can affect the business demonstrates the usefulness of a close bond between information systems and executives.

Personalizing information systems services for executives. Executives should use the appropriate information services to make key decisions and set direction. Executive services can take the following forms:

- Executive reports. It is not always necessary to single out executives as a special class of user. Yet there is no denying that some of their needs are distinct and different from other information systems customers'. It may be opportune to generate reports for top management that highlight selected summary information on a companywide basis.
- Information center services. More sophisticated executives can simply be given tools so they can serve themselves with more flexible, effective technical solutions. The MIS manager can make this approach successful by selecting tools with the right mixture of simplicity, flexibility and power.

In addition, MIS can deliver clean, appropriate information coupled with training tailored to executive needs. Such an executive program will dramatically demonstrate the ability of MIS to effectively deliver the benefits of technology.

Any or all of these executive support programs could constitute a means to improve the relationship between the information systems department and executives and thereby enhance the impact of information systems on an organization.

The key to success is for the MIS manager to take action and demonstrate initiative. Those who remain passive are sure to see their departments decline. To avoid this fate, MIS needs to create an executive support program with elements chosen to make executives more effective. That, in turn, will make the MIS manager more effective as well.

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Letter

Continued from page 5

Technology has an operational Elbrus supercomputer that can perform more than 125 million operations per second.

Soviet achievements can also be illustrated with our peaceful space exploration program that includes such projects as the Mir orbiter, the flight by automatic interplanetary probes to Halley's comet and the upcoming launch of a space probe to one of the Martian satellites, Phobos, among other things.

Cooperation between the U.S. and the Soviet Union in the field of computer technology can and must benefit both sides. It is imperative to remove all the barriers in the way of such cooperation. The very fact that "Information USA" is in the Soviet Union — which, incidentally, is the first American exhibition in our country after a seven-year break — is a good sign. One only wishes that with all the words about freedom of information, the exhibition's organizers provided a little more real information.

Andrei Baidak
Editor
North American Desk
Novosti Press Agency
Moscow

news & analysis

UPDATE

A Compaq classic passes on

The Compaq Portable is dead. Long live the Compaq Portable 386.

The introduction of the svelte, 20-lb, Intel Corp. 80386-based Compaq Portable 386 from Compaq Computer Corp. signaled the demise of its forbear, the portly Compaq Portable. The original Portable, based on the Intel 8088 chip and weighing in at 28 lb, pales beside the flashy 386 model. Moreover, the 8088 machine had been losing sales to the Houston vendor's more powerful Portable 286.

Yet the Portable will not be forgotten. Earning $111 million in revenue for Compaq its first year, the Portable was the first IBM Personal Computer compatible. Additionally, the Portable also offered superior performance through the use of the Intel 8087 math coprocessor. In the process, the Portable inspired a multimillion-dollar IBM PC-compatible industry.

The legacy of the Portable should carry on through Compaq's 286 and 386 PCs and through the computers of competing vendors that strive to give users Big Blue compatibility st a better price and performance than IBM.

EMS Version 4.0 settles specifications debate

The rollout of the Lotus/Intel/Microsoft Expanded Memory Specification (EMS) 4.0. hails the end of warring between several heavyweight personal computer industry players.

Until Version 4.0 arrived, the industry was fractured along two lines: EMS, which was supported by its developers, Lotus Development Corp., Intel Corp. and Microsoft Corp.; and Enhanced EMS, which was backed by AST Research, Inc., Quadram Corp. and Ashton-Tate.

Enhanced EMS and earlier versions of EMS are similar. However, where Enhanced EMS provides concurrent processing of applications within the 640K bytes of conventional memory provided by Microsoft's MS-DOS, EMS does not. EMS 4.0 now adds the multitasking functionality found in Enhanced EMS, making two competing specifications unnecessary.

Recognizing this overlap, several vendors, including Ashton-Tate, Borland International, Inc., Quarterdeck Office Systems Co. and AST Research, have announced that they will support EMS 4.0.

"EMS 4.0 is s compromise solution," says Jonothan Yarmis, a senior personal computer research analyst at Stamford, Conn.-based Gartner Group, Inc.

"In EMS 4.0, Lotus, Intel and Microsoft are saying to Enhanced EMS supporters, 'Your way was right, and we're going to include it under our umbrella,' " Yarmis explains. At the same time, Enhanced EMS supporters are willing to support EMS 4.0 because it provides the functionality they want, he says.

With EMS 4.0 as a generally accepted standard, more users , may turn to EMS products to provide multitasking on MS-DOS. "The division between EMS and Enhanced EMS hurt user acceptance," Yarmis says. "People would straddle the fence and not accept either specification because of the differences."

EMS will also get a boost from Microsoft Windows/386, which has EMS 4.0 built into it, Yarmis adds. "Users and developers may not specifically want EMS, but they will take advantage of it in Windows/386," he explains.

Ultimately, the unified support for EMS 4.0 may have only a limited impact on the PC market, Yarmis asserts. "Microsoft's OS/2 is the long-term strategic winner in the PC operating system battleground."

Experts say OS/2, not pride, comes before the fall

The Extended Edition of IBM's OS/2 will be available within 1½ years, several industry experts estimate. However, some third-party software developers place availability of the Extended Edition's first version as early as fall 1988.

Either way, the first release is unlikely to contain all of the

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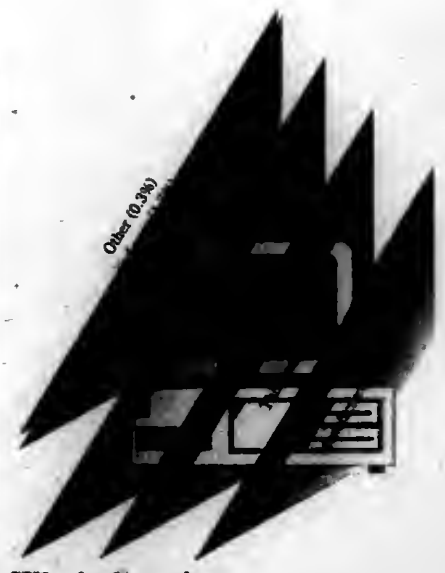

Who's keeping the hardware running?
Primary sources for hardware maintenance

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GRAPHIC BY BRUCE SANDERS

Good stuff, cheap: PC AT market booms

What a situation. IBM and Microsoft Corp.'a OS/2 operating system is exciting enough but will not be available for quite some time to take advantage of the power of Intel Corp. 80386-based machines. IBM's Personal Computer and Personal Computer XT are available, but only for the time being; IBM announced it will stop producing them.

About to take advantage of the situation are IBM Personal Computer ATs, systems in between the PCs and high-end 80386 systems in power and performance. Although IBM has also said it will stop producing its original ATs in the future, IBM's strategy seems clear to Bill Kirwin, program director of microcomputing at the Gartner Group, Inc., a Stamford, Conn., market research firm. He says that because OS/2 applications will not appear for a while, IBM has stopped making its low-end PCs to channel more buying power into the PC AT market.

It will be a lot easier for users to cross over from the AT's Intel 80286 processor to the 80386 with OS/2, which will act as a software bridge, than it will be to jump from the Intel 8088-based IBM PCs and XTs, which will not run OS/2, . to 386-based machines. As a result, micro users and software developers do not see the same kind of built-in obsolescence with the AT that they do with the PC. This perception should make for s booming AT market.

"We don't feel there's enough cause now to go with the 386 machines," explains Ron Bastien, data processing manager for the Property Appraiser's

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Against all odds, the on-line data base service industry thrives. Page 14.

Update

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Extended Edition's functions, according to IBM. Features that will eventually be part of the Extended Edition include IBM's Token-Ring and PC Network support, IBM 3270 and 3101 terminal emulation, Digital Equipment Corp. VT100 terminal emulation and IBM Systems Network Architecture support.

Let the buyer beware: Postscript clones inexpensive but unreliable

Desktop publishing vendors are offering clones of Adobe System, Inc.'s Postscript page description language that save users money over the original.

However, publishing consultants caution users that the savings may not be worth the risk.

"Users might save $1,000 to $1,500 on a Postscript clone printer, but they are risking incompatibility with their publishing packages," warns Tony Bove, co-editor of "Desktop Publishing, Bove and Rhodes' Inside Report," published in San Francisco.

In addition, "If the pages do not look exactly the same as they do with Postscript or if the graphics effects don't come out properly, who do you go to?" he asks.

"The risk a user faces with a clone is how good the implementation is and how well the type fonts match," concurs Jonathon Seybold, president of Seybold Publications, Inc. in Malibu, Calif. "A clone may work well for someone else's work, but not for yours."

The problem is that cloning software is far more difficult than cloning hardware, Bove and Seybold agree. Vendors who provide Postscript clones are actually providing clones of the Postscript language interpreter.

"It's very difficult to fully guarantee that the clone will be 100% compatible with the Postscript interpreter because Adobe's own interpreter has bugs in it," Seybold says.

A second software problem lies in the type fonts supported by the interpreter. A non-Adobe Postscript clone has to provide non-Adobe type fonts that are compatible as well, Seybold explains.

"It's difficult to get equivalent type fonts in which all the characters are the same because Adobe has built special links into its fonts that know how to proportion type," he says. "Because this is proprietary to Adobe, no clone maker can use Adobe's font-scaling system."

Instead, clone firms have to rely on third-party vendors for these scaling systems. Three major sources of fonts are Bitstream, Inc., in Cambridge, Mass., Compugraphic Corp. in Wilmington, Mass., and URW in West Germany, Seybold notes.

More than a dozen vendors are actively implementing Postscript clones. However, none of these are deliverable products, Seybold asserts. "Aldus Corp., a leading publishing vendor, has not yet received one clone for testing," Bove says.

Before any clones are ready for market, developers have to test them with popular publishing applications, such as Aldus's Pagemaker, to ensure that they will work on most publishing systems, Bove explains. The fact that clonemakers have not begun testing indicates that the Postscript clones are not fully developed, he says.

Despite the potential problems associated with Postscript clones, they have had positive effects.

For example, the fact that vendors have chosen to imitate Postscript over other page description languages reconfirms Postscript as the industry standard, Bove says.

Futhermore, according to Seybold, the clones are driving down the cost of Adobe Postscript licenses.

Adobe is also taking copy protection off its fonts, Bove says.

Together, the effects of clones are benefitting both publishing vendors and users, he claims.

Borland rolls out corporate user support program, volume discounts

Borland International, Inc. in Scotts Valley, Calif., has joined the growing ranks of personal computer application vendors offering corporate support programs.

Borland's program includes discounts of 35% to 50% on minimum volume software purchases of $500, telephone support, training, product registration, central-site upgrades and newsletters. These support services cover products from Borland and applications from Belmont, Calif.-based Ansa Software, which Borland recently purchased.

The Borland support program reflects corporate users' demands for technical support and centralized distribution of update releases, according to James Davis, senior manager for Nolan, Norton & Co., an end-user computing service headquartered in San Francisco.

"Corporate managers suffer a lot of frustration handling hundreds of copies every time there's a new software release," he says. — RH

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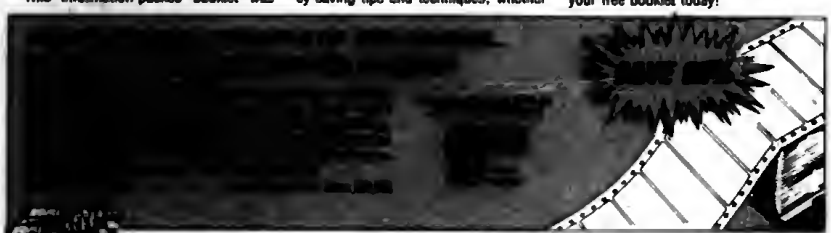

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Apple teams up with Sybase

Mac, Sybase DBMS duo expected to tackle business sector

In a move to attract Fortune 500 users, Apple Computer, Inc. in Cupertino, Calif., has made a minority investment in Berkeley, Calif.-based Sybase, Inc. and is expected to offer a Macintosh version of Sybase's distributed data base management system.

The Sybase DBMS, which is based on IBM's SQL, will give Apple a good entry into the business arena, says Mark Hoffman, Sybase's president.

"If Apple is to succeed in the Fortune 500 market, it must have an SQL DBMS," concurs Ronald G. Ross, editor of the "Data Base Newsletter" published by Boston-based Database Research Group, Inc. "Apple's move does not surprise me," he says.

The addition of Sybase for the Macintosh is one part of Apple's plan to go from a $2 billion company to a $4 billion one, Hoffman says. "To grow that much, Apple must penetrate the business sector," he states.

The Macintosh II already appears to be gaining favor among the corporate users it covets. "It hasn't been verified, but I have heard that 50% of the Macintosh II shipments are going into the business environment," Hoffman says.

Apple and Sybase have made no decisions about what operating system will be used for the Sybase Macintosh DBMS, but Hoffman describes two possible options. "A front-end version of Sybase for smaller systems, such as the Macintosh SE, would run on the Macintosh operating system," he suggests. Also, "Sybase on a Macintosh II serving as a data server would probably be ported to Unix," Hoffman says. "Those are the logical ways to go."

A note of caution

Despite its potential for attracting business users, the success of a Macintosh/Sybase DBMS combination has yet to be determined, Ross cautions.

First, Sybase is a relatively new DBMS that has not had a long time to prove itself. Second, he notes, "There is a big question about how well a Macintosh running Sybase can interconnect in an intelligent way to an IBM mainframe running SQL and DB2."

While Ross does not anticipate any special problems, he says, "It's a wait-and-see situation." — RH

dB

By Rich Tennant

IBM PS/2 architecture threatens third parties

When IBM introduced the Personal System/2 earlier this year, the machine was widely hailed as a significant advance over the existing IBM Personal Computer. However, some observers suggest that the PS/2 poses a severe threat to two industries — IBM's third-party suppliers and the third-party vendors of PC hardware that supply the enormous PC aftermarket.

Both groups are finding that many of the functions their products were meant to provide are neatly reproduced on the PS/2's native hardware.

According to computer consultant Alan Kaplan, president of American Index Systems in Medfield, Mass., "If you're saying that IBM is taking the functionality, which [the company] was previously buying from third parties, and putting it in application-specific integrated circuits, then, yes, by definition, you're going to have dislocations."

Sophisticated system

The specific threat that PS/2 poses for third-party vendors is in its sophistication. The machine provides functions, such as improved graphics, that previously could only be had via board-level products.

Particularly dangerous for the independent vendors is the PS/2's use of very large-scale integration (VLSI) chips. With VLSI design techniques, it is possible for IBM to squeeze down entire board-level products (or, in some cases, even entire systems) to a single chip. And in the PS/2, IBM has made a large investment in such chips.

Already some firms have begun to suffer because of the VLSI chips. Xebec, in Campbell, Calif., was a major supplier of disk drive equipment to IBM. Indeed, 50% of the company's business came from IBM — all of which vanished with the PS/2.

Small third-party vendors selling single products to end users may be even harder hit, explains Norma Gildea, director of marketing for Ideassociates, Inc., a PC board and peripheral maker based in Billerica, Mass. "The people who could be hurt are the companies that were dependent on a single line of boards. For example, the makers of graphics products and I/O boards [are] vulnerable," she claims.

Third-party vendors seem to be following a few fairly well-defined courses of action to deal with the PS/2. IBM's former suppliers appear to be moving into other fields and technologies. Xebec, for instance, is currently attempting a rapid diversification into such areas as thin-film disk-drive heads.

PC board and peripheral makers, meanwhile, seem to have two main strategies. First, they say they are planning to exploit the large installed base of PCs and PC compatibles already on the market. "There are still a lot of PCs out there and a lot of PC users looking for products," explains a spokeswoman for Boca Raton, Fla.-based Boca Research, Inc., a firm that makes boards and peripherals for PC compatibles. "We think [these firms will be out there] for a long time to come."

Life goes on

Ideassociates' Gildea agrees. "While it's true IBM no longer makes the Personal Computer XT and the AT, there are lots of companies out there who still do — like Compaq Computer Corp."

Second, the board vendors are upgrading their own product lines to provide functions not yet available on the PS/2. According to Gildea, "For us, the PS/2 has actually meant new products. For instance, consider communications. IBM currently doesn't offer any communications products for the PS/2 at all. We, however, do." Currently, Ideassociates offers a line of boards that link the PS/2 to a variety of local-area networks.

Clearly, then, the vendors that survive the PS/2 will be those that can rapidly adapt and seize new markets. "You've got lots of historical precedent," American Index's Kaplan says. "IBM used to buy transistors, you know. Then when people developed integrated circuits, IBM stopped buying transistors, and some transistor suppliers went bankrupt. On the other hand, Intel Corp. emerged as IBM's new supplier of integrated circuits."

He concludes with a warning to those in the third-party field: "The [transistor] vendors responded by producing more complex systems or by dying. It's a natural evolution." — MT

PC AT boom

Continued from page 11

Office in Talahassee, Fla. "There's not enough software," Bastien says.

That is certainly not the case with the ATs and AT compatibles, which have a huge installed user and software base.

When IBM rolled out its Personal System/2 line, it also included new AT-like, 80286 models in the announcement. IBM wants as much of this invigorated AT market as it can get, but this task will not be simple. The AT market has established compatible and clone competitors that are going after IBM with increased price/performance ratios that will benefit users.

There are good deals to be had in the 80286 market. Competitive pressures are forcing AT-compatible makers to offer more speed and power on their systems at lower prices.

The thrust within the expanding AT market might be taking two routes. Roger D. Sparks, vice-president of marketing at Somerville, N.J.-based Thoroughbred Software, whose operating system is bundled with 286- and 386-based systems, says 286 systems will be increasingly used as hubs for multiuser applications.

"The erosion in 286 hardware prices plus the new multiuser software being ported to the 286 microprocessor means that multiuser, 286-based configurations supporting up to nine workstations will be cost-justifiable," Sparks says. "This trend is going to do damage to the low-end local-area network market."

In the meantime, however, ATs could also expand their roles as file servers within local-area networks (LAN). Forrester Research, Inc., a Cambridge, Mass., research firm, estimates that up to 40% of all PC ATs are currently being used as LAN file servers in Fortune 1,000 firms.

The other thrust is in the more traditional stand-alone AT market. John Sullivan, vice-president of international sales at Leading Edge Products, Inc., a Canton, Mass.-based producer of stand-alone AT compatibles, says that the AT market will stay charged for at least the next two years. "Prices will remain stable," he says, "but within that price range you're going to continually get more storage, faster add-in processor boards and better graphics." — SK

NEWS & ANALYSIS

On-line services teeter on the brink of success

The on-line data base service industry is booming despite problems that would cripple many another field.

Recent analysts' reports suggest that while on-line services can be immensely profitable to some information vendors and immensely useful to executives in almost every profession, the on-line service industry is plagued by high risks, intense competition, deep divisions between different segments of the industry and the ongoing threat of government regulation.

"[The on-line service field] is like gambling," says one securities analyst, who asked not to be named. "If you win, you could win big. If you lose, you lose it all."

The status of the on-line industry could be important to MIS officers because of data processing departments' increasing involvement with end-user computing. During the last few years, end-user computing, either in the form of personal computers or executive information systems, has included an ever-growing component of on-line data base access.

Financial service executives, for instance, now regularly obtain business information from such services as Dow Jones News/Retrieval. These executives can even trade securities on-line via services such as Boston-based Fidelity Investments' Fidelity Investors Express.

There are a host of other data bases beyond financial on-line services; however, the most popular of these offerings has a distinct business orientation. "Financial information is, of course, a major part of the market," notes Kenneth Bosomworth, president of International Resource Development, Inc., a New Canaan, Conn., market analysis firm. "But government data bases are a close second; figures from the Department of Commerce and the like are very popular."

Corporate with a passion

In some ways, the development of on-line services has paralleled the evolution of personal computers. Just as PCs were originally aimed at individual hobbyists, so, too, were on-line services initially pitched toward home-based hackers. Now, however, both PCs and on-line services have gone corporate with a passion — and for good reason. According to Bosomworth, "About 90% of vendors' revenue is derived from business users."

But despite the success of some of the services, many analysts are suggesting that the on-line industry is still fragile. A recent survey of 40 industry leaders by New York-based accounting and management consulting firm Coopers & Lybrand suggests that the on-line business has far to go before it can command mass market appeal. In particular, the survey respondents said, on-line services will not make the jump from large organizations to small ones until the services become cheaper and easier to use.

Like Coopers & Lybrand, International Resource also recently completed a report on the future of on-line services and found that on-line data bases are a promising industry but not one for the faint of heart. "Publishing is a risky business," Bosomworth says. "Electronic publishing is even more risky because you've got to deal with the question of how you present and format the data." He explains that in conventional, paper-based publishing, the vendor has at least some idea of what has been done before. The standard forms for novels, dictionaries, directories and so forth are well established.

But with on-line services there are far fewer guidelines. How information should be presented on a PC screen, how it should look, how it should be searched, how or if it can be legally protected with copyrights and how to profit from the material all remain open questions that the vendors of on-line services must answer.

Equally unsettling to the industry is that no one is yet certain who will eventually be the main players in the market, even in the short run.

At the moment, the field is dominated by a few large on-line systems operators, most of which are represented in the on-line industry's only trade association of note, the Washington, D.C.-based Information Industry Association.

Upsetting status quo

But according to the Coopers & Lybrand report, the information providers — the organizations that own and supply the data bases that the systems operators bring to the end users — are growing increasingly dissatisfied with the existing order.

"When systems operators were king," the report notes, "they clearly positioned the end user as *their* customer. To this day, certain systems operators refuse to reveal even the names of end users to the information providers that support their systems. But now, information providers are taking aggressive action to strengthen their identities in the minds of end users."

The industry's system operating elite is also further threatened by new players that would like to offer their own on-line systems. For instance, the regional Bell holding companies that emerged from the breakup of the Bell system have expressed an interest in becoming on-line carriers — a desire that terrifies systems operators.

However, in September, U.S. District Court Judge Harold Greene issued a series of rulings that may have effectively

banned the telephone companies from on-line services.

"Times are tougher for the regional holding companies," says C. William Reed, director of electronic communications services at market research firm Link Resources, Inc. in New York. "[Judge Greene's] idea was basically to tell the local phone companies that they could offer gateways into on-line data base services and they could bill for those services but [they could not share revenue]."

Empty pockets

In other words, the holding companies can receive income for connect time but cannot receive a percentage of the fees that the information providers charge the end users — as can existing systems operators.

"It's not clear how interested the telephone companies would be in all this without revenue sharing," Reed says.

Still, stability continues to elude the industry, even with Judge Greene's most recent ruling.

According to Reed, "The wild card in all this is what Greene stuck on the end of his judgment. He said that the regional holding companies could offer electronic white pages. But how do you define 'white pages'? If you can do an automated search of names in those white pages, perhaps by topic, then what's the difference between that and electronic yellow pages?"

Paper-based yellow pages are already a source of profit for the phone companies, whereas the white pages are not. Greene's ruling seems to view an electronic version of them as being no different.

But if the regional holding companies were allowed to produce an electronic white pages that could be searched by type of business or topic rather than merely for names, it would be difficult to distinguish such a service from a commercial electronic data base. Thus, the ruling leaves open the possibility that the holding companies could support products that would be on-line services in everything but name.

Reed says he feels that the recent ruling will have a positive effect on the industry, no matter what it does to the regional holding companies. For one thing, it gives the smaller information vendors a chance to link up with the marketing muscle of the local telephone companies, even though they cannot provide revenue sharing.

Helps out the little guy

"The people most affected," Reed explains, "will be the small vendors in search of a mass audience."

Meanwhile, though, the situation remains fluid. None of the industry vendors nor any of the system operators have a lock on success.

"The biggest problem they have," International Resource's Bosomworth reports, "is a dilemma publishers have always had: How do you come up with a best-seller?" — MT

Vendors vie for add-in crown

It is shaping up to be the battle of the software add-ins, those smaller programs designed to help users get more mileage out of personal computer programs.

Ashton-Tate is still the add-in heavyweight. The Torrance, Calif.-based software developer has an estimated 350 to 400 add-in products on the market directed exclusively at its Dbase III PC data base management system.

Lotus Development Corp. in Cambridge, Mass., is closing in, however. At last count, the company had close to 200 add-in products, and that figure is climbing rapidly, according to David Thomas, technology analyst at Hambrecht & Quist, Inc. in New York.

Add-ins are usually aimed at expanding the power of a software program or adding some element that was omitted, intentionally or not, by the original software vendor. Add-ins are also generally less expensive than the programs they are supporting, although that can depend on the actual functions served.

Inword from Funk Software, Inc. in Cambridge, for example, is a 1-2-3 add-in word processor that stretches the spreadsheet's limited word processing capabilities. Inword even provides its own drivers, obviating the need to install Inword each time a printer is changed.

Fetch, a 1-2-3 data base retrieval add-in from Manusoft Corp. in Culver City, Calif., enables 1-2-3 users to selectively send and extract data to and from various data bases, a capability 1-2-3 lacks.

Why Lotus is now actively promoting the add-in market is not entirely clear. Thomas suggests that in the past 18 months, Lotus, a company previously known for its aloofness from users and other software developers, has taken on a new attitude.

Changes at the top

"Part of it might have to do with Jim Manzi's coming on as Lotus president following [Lotus founder] Mitch Kapor's resignation in 1986," Thomas says. "Manzi has a better business world view than Kapor, and part of Manzi's thrust is to further entrench 1-2-3 as the market's premier PC spreadsheet."

Add-ins play a big role in that cause, and to help keep the ball rolling, Lotus has been offering 1-2-3 value-added add-in products such as Hal, One Source Freelance Plus and, more recently, Speedup and Learn.

Thomas says that the existing 1-2-3 user base alone is big enough to feed the add-in market for quite some time. "It's certainly big enough for Lotus and add-in vendors to live together," Thomas says. "Lotus realizes that more add-ins create more value-added features around 1-2-3 and create more 1-2-3 sales." — SK

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Today's leading-edge, large-system technologies could be tomorrow's commercial desktop success stories

High-tech horizons

BY MICHAEL TUCKER

Personal computers are one of the great technological success stories. In less than a decade, they've gone from curiosities to a major industry. In the process, PCs have undergone an amazingly rapid evolution, going from 4-bit systems with no data storage to 32-bit monsters with gigabytes of random-access memory.

After such an impressive start, what, then, is in the cards for PCs in the next decade? What sort of technologies are now shaping the destiny of microcomputers and the work of computer users?

While the complete answer to those questions remains hidden from all but functioning prophets, we can glean a hint of things to come from the technologies that are currently applied to PCs on an experimental basis.

These technologies have only questionable value to MIS officers doing serious work, and many will never escape that status. However, some experimental technologies will succeed and have a vast impact on computing. After all, 10 years ago, 16-bit chips seemed just as removed from the real-world work of MIS.

Microprocessors are among the parts of PC hardware that have been most subject to change. It was computer designers' ability to squeeze an entire CPU into a chip that made PCs a reality in the first place.

Perhaps only mass data storage (which has gone from primitive tape systems to modern minifloppies in only a few years) and display technology have evolved as rapidly as microprocessors.

During the last two years or so, the computer industry's attention has been focused on the emerging generation of 32-bit chips — particularly the Intel Corp. 80386 and the Motorola, Inc. 68020. Between the two, the processors can be said to define modern personal computing, with the Intel chips taking the lion's share of the IBM Personal Computer AT, Personal System/2 and compatible markets and the Motorola products showing up in the modern Macintoshes from Apple Computer, Inc.

Tucker is *Computerworld Focus*'s features editor.

However, these two chips are not alone, and their technical dominance should not be taken for granted. After all, the chips' prominence came at the expense of products from other vendors, such as Santa Clara, Calif.-based National Semiconductor Corp. and Campbell, Calif.-based Zilog, Inc. Few today remember that National Semi and Zilog also had 32-bit offerings, and as late as 1985 both firms were serious contenders for the roles that Motorola and Intel now hold.

In fact, the 32-bit chip is beginning to seem a little old hat. Already, new and improved microprocessors are beginning to show up on the edge of the 32-bit market to challenge the 80386 and 68020 establishments. The common characteristic of these challengers is that they exploit the reduced instruction set computing (RISC) design. In RISC-based systems, the number of internal, micro-coded instructions is kept to a bare minimum to decrease complexity and increase speed.

"If there is a common trend in microprocessors at the moment, it's the RISC-based architectures," notes Andrew S. Rappaport, president of the Boston-based semiconductor market consultancy Technology Group, Inc. "They may not be showing up yet in the off-the-shelf PC, but certainly they're what's happening in workstations and in coprocessor boards for PCs," he says.

For instance, Fairchild Semiconductor Corp. in Cupertino, Calif., which was recently acquired by National Semi, is now fairly well-known for its Clipper 32-bit processor. The Clipper, which is actually a chip set containing a CPU and two cache-memory chips, combines conventional processing technology with a RISC-inspired design to yield a performance of 5 million instructions per second (MIPS) or more. The

ROSS MACDONALD

company claims that, under certain conditions, a Clipper-based system can outperform a Digital Equipment Corp. VAX 8600. You can, in fact, already buy coprocessor boards based on the Clipper for personal computers from companies such as Opus Corp., also in Cupertino.

Another player in the RISC processor market is Mips Computer Systems, Inc. in Sunnyvale, Calif. Mips Computer describes itself as "a supplier of RISC-based system building blocks." This means OEMs of Mips Computer products can purchase anything from single chips to complete systems.

The firm's current OEMs include Prime Computer, Inc. in Natick, Mass., and Dana Computer, Inc. in Sunnyvale — companies that aim at producing personal supercomputers, machines with Cray Research, Inc. supercomputer-like power that would sit on the desktop. That job is easier than it sounds, however, because the uppermost reaches of the Mips Computer product line includes things like the MIPS 1000, which some analysts have clocked at 10 MIPS.

Digital signal processors

The RISC arena, however, isn't alone in introducing technologies to the world of PCs. For example, Dallas-based semiconductor giant, Texas Instruments, Inc., has long marketed digital signal processors (DSP), specialized chips that perform the analysis and manipulation of complex analog signals like those of radar and voice systems.

The digital analysis of an analog signal is no easy task. A DSP has to be a very powerful computing device in its own right. For instance, TI claims a 5-MIPS rate for its top-of-the-line DSP, the TMS320C30, which was introduced this year.

To date, DSPs have shown up in PCs mostly in areas in which dedicated, application-specific chips did not yet exist, such as in some graphics tasks. Some analysts have suggested that we will actually see fewer DSPs in individual applications. "We'll see them gradually phased out," says Alice Leeper, semiconductor industry analyst with Dataquest, Inc., a market research firm in San José, Calif. "We'll have more application-specific integrated circuits taking their place."

But for certain tasks, a DSP's exotic architecture and relatively low price (roughly $250 each and much lower for larger orders) permit it to outperform conventional processors, notably numerically intensive computation. There are already several DSP-based coprocessor boards available for the PC, such as the Sky board from Sky Computer, Inc. in Lowell, Mass.

DSPs also seem to be good in applications, such as speech recognition and synthesis, that require a machine to imitate some aspect of a human being. (This year, one toy company, Worlds of Wonder, Inc. in Freemont, Calif., is set to ship "Julie," a DSP-equipped doll that will be able to hear and recognize a fair-sized vocabulary.)

The unique power of DSPs to perform human-like functions seems to be because human processing is analog rather than digital. "People are beginning to say, 'Hey, the brain is analog. Maybe we should be analog, too,' " the Technology Group's Rappaport notes. There is currently a renaissance in analog computing, with designers putting together new generations of analog chips.

But while we wait for that analog technology to come on-line, DSPs can provide many of the same services. Perhaps in the near future, we'll see extremely sophisticated user interfaces based on DSPs.

TI recently showed what could be done with DSPs in coprocessor boards with the debut of the Odyssey board for its Explorer line of artificial intelligence-based workstations. Odyssey uses four DSPs, each running at 5 MIPS, to yield an extremely powerful digital signal processing system that is used closely with the Explorer's native symbolic processor. A developer might, for instance, do rapid software prototyping on the Explorer, then shift the program over to the Odyssey for test and analysis.

Some technologies available today are considered exotic for PCs not because they are new and untried but solely because they have just not made the leap to the desktop.

Priced at more than $12,000, Odyssey certainly is not meant to be merely a coprocessor with any PC from any vendor. But although it's not a PC product, Odyssey is a good indication of things to come.

Another exotic technology that promises to enrich PCs is the symbolic processor. Symbolic processors are those processors that can manipulate not only numbers and characters but symbols as well. They are renowned as development platforms for artificial intelligence applications — so much so that they are sometimes called "LISP engines" — but they also have uses in many situations in which large amounts of data must be manipulated in a hurry.

LISP engines have traditionally been workstation-size machines with the least expensive of them priced around $35,000.

This kind of pricing has severely limited the appeal of symbolic processing on desktop systems despite the fact that the technology might have real utility for end users. Complex financial models, expert systems, executive information systems and similar strategic computing applications could all benefit from an infusion of symbolic processing technology.

Symbolic changes

That infusion could now occur because conventional processors are getting much better at symbolic processing. PC coprocessor boards that look and act like board-level symbolic processors have started appearing in the marketplace. For instance, last April A. I. Architects, Inc., in Cambridge, Mass., introduced the Hummingboard for the IBM PC AT.

Based on the Intel 80386 and costing just under $3,000, the Hummingboard is an extremely powerful accelerator board that lends itself particularly well to symbolic-style processing. It was developed in association with Cambridge-based Gold Hill Computers, Inc., which is one of the leading vendors of the LISP language for the PC.

However, something even more bizarre is happening just down the street in Cambridge from A. I. Architects and Gold Hill, at Symbolics, Inc.

Symbolics is a leading vendor of symbolic computing technology. Its only peer was Lisp Machine, Inc., in Andover, Mass. Both companies were started by MIT staff members who developed the first LISP engines in the 1970s.

During the heyday of the AI market in the early 1980s, both Lisp Machine and Symbolics were extremely successful. Then, between 1985 and 1986, the LISP engine market slumped due to a number of factors, not the least of them being increased competition from more sophisticated conventional machines. Researchers, who had formerly opted for nothing but Symbolics systems, were turning to a new generation of 32-bit workstations and even PCs.

Hard times ensued for the LISP hardware makers. Lisp Machine had to initiate bankruptcy proceedings. Symbolics also suffered severe reverses and had to lay off a large portion of its work force. Some analysts were discussing the demise of all the LISP engine vendors.

However, Symbolics had a surprise up its sleeve.

At about this time, TI developed a single-chip LISP engine. The TI chip, which had been supported by heavy government funding, was finally introduced this year. So far, the chip is being sold only as part of TI's Explorer symbolics workstation.

Then, stunning the industry, Symbolics announced that it, too, had a single-chip LISP processor, called Ivory. And unlike TI, Symbolics revealed plans to market it on an OEM basis. By 1988, the company says, it expects to be selling at least some Ivory-based boards for non-Symbolic computers. Later, it will market the chip itself.

As yet, Symbolics won't say if its Ivory boards will be available for the PC. But clearly, the option exists and, if the company does sell the chip, then some value-added reseller is almost certain to produce a PC coprocessor.

Meanwhile, as individual PC processors are rapidly changing, so, too, is the whole concept of PC processing. In recent months, products have begun to emerge that can bring exotic technologies, such as multiprocessing and parallel processing, to the individual desktop.

For example, New York-based Human Devices, Inc. recently put Parallon 1 into beta test. Parallon 1 is a $2,500 board that contains eight processors, each compatible with the Intel 8088. Once the Parallon 1 is installed, the PC's native processor acts as a communications manager for the system.

With a single Parallon 1, a user gets 1 MIPS of computing plus Human Devices' unusual software development and operating environment, which makes parallel processing possible under Microsoft Corp. MS-DOS. The Parallon 1 is, in fact, being marketed as a way of making parallel processing accessible to the MS-DOS masses.

Up to 16 Parallon 1s can be put into a single, passive PC back plane. Company officers report that such a system would cost roughly $20,000 but would provide up to 100 MIPS in certain applications.

The Apple Macintosh also has vendors willing to supply parallelism. Mechanical Intelligence, located in Cardiff, Calif., markets the MI-4 multiprocessing module that fits into Apple's Nu-Bus in the Macintosh II.

The MI-4 contains a Transputer microprocessor from Colorado Springs-based Inmos, Inc. The Transputer has both 32-bit processing power and communications hardware. It is, in effect, a microprocessor designed for multiprocessing applications and has already appeared in massively parallel devices, such as the Computing Surface from Meiko Ltd. in Bristol, England.

With a single MI-4 in place, a Macintosh user reportedly has access to about 10 MIPS as well as the power to do multiprocessing or parallel processing in tandem with the Macintosh's native CPU. But you can then add another MI-4 and another and another. With an expansion chassis, company officers say that you would probably reach your limit with 40 processors, although four processors is the far more common number. A single MI-4 costs approximately $2,000.

Both the MI-4 and the Parallon 1 are being used primarily for scientific and technical computing. But there is no reason why they could not be put to more traditionally business-related uses. For example, some analysts have suggested that multiprocessor systems would be particularly useful in searching very large data bases. Each processor would perform the same search but would search different data. Thus, huge chunks of information could be examined very quickly.

Thinking Machines Corp., located in Cambridge, has demonstrated this sort of application with its titanic CM2, which boasts 64,000 processors. In a test, the CM2 was able to do a full-text search of an entire data base in a matter of seconds.

An expensive capability

Naturally, few MIS officers would care for a CM2 with its $1 million price tag. But the same MIS people might eventually consider giving multiprocessor desktop systems to corporate executives so that they could quickly and effectively search central corporate data bases.

However, RISC processors, signal processors, symbolic processors and multiprocessors are technologies available today. They are considered exotic for PCs not because they are new and untried but solely because they have just not made the leap to the desktop.

What about the really crazy stuff? What are the technologies that have not yet even been applied to supercomputers, much less PCs, but which might be running on PCs someday?

One could mention new processor materials or even talk about optical computers and superconducting computers. Yet maybe the best sign of PCs' future direction recently came from IBM. Last August, researchers at IBM's Yorktown Heights, N.J., facility announced that they had produced transistors that were one tenth of a micron in size — the smallest complete silicon transistors yet devised. IBM is even using a new term — "ultra-large-scale integration" — to describe the technology.

If devices on this scale prove practical, then computers could soon be vastly smaller and far more powerful than ever before. Tomorrow's desktop systems would equal the performance of today's mainframes and supercomputers or even far surpass them. What *that* kind of power on a PC will do to and for MIS remains to be seen. ❖

Beyond the hypertext hype

BY REBECCA HURST

Hypertext. A few months ago, only the computer industry's leading-edge minds discussed the concept. Today, the word seems to be on everyone's lips. But even as people laud the capabilities of hypertext-based products, many say they are confused about what these products are and why they are useful. Data processing professionals and corporate managers, in particular, question whether products based on the hypertext concept can offer useful business applications.

The catalyst behind this interest made its appearance in August at the Macworld Expo in Boston. There, Apple Computer, Inc. introduced its personal tool kit, a product dubbed Hypercard. Standing-room-only crowds gathered to watch Bill Atkinson, an Apple fellow and Hypercard's developer, demonstrate the product on an Apple Macintosh II.

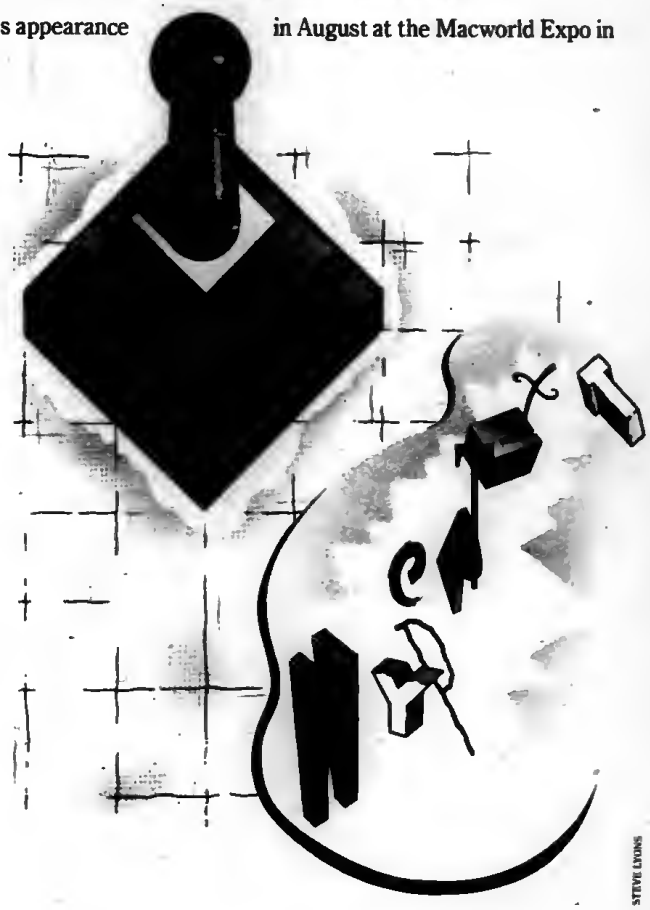
They oohed as Atkinson showed how a user could clip a telephone dialing function button, paste the button into a card (a set of data within a file) containing a name and phone number and then click the mouse on the button to make it automatically dial the number. They aahed as he moved to a card in another stack, or file, of clip art and clicked the mouse to initiate an automatic, rapid-fire succession of cards with illustrations of hats.

This interest in Hypercard's capabilities has carried with it a widespread interest in the concept of hypertext. Although Apple representatives did not include the term in presenting Hypercard, many people quickly made the connection between the product and the hypertext concept introduced by Ted Nelson in 1965.

Hypertext is an associative, electronic representation of information. One way to think of hypertext is to compare it to structured programming languages. For example, programming often makes a person define the relationship between ideas in a linear-logic or if-then structure. By contrast, hypertext is not limited to this linear form but rather enables a person to look at a collection of ideas and then pull them together in ways that describe the relation or association among them.

Nelson, who has written two hypertext-related books, *Computer Lib*, which describes the hypertext concept, and *Literary Machines*, developed the hypertext idea in reaction to the artificial limitations imposed on people by hierarchical, structured languages such as Fortran and Cobol.

"Hypermedia allows us to represent the



STEVE LYONS

Hurst is *Computerworld Focus*'s senior writer.

true structure of interconnections of things and ideas rather than to fit them to an artificial structure."

Not the only nor the first

Apple's Hypercard is one product that provides a mechanism for linking information by means of association. However, it is not the only such product, nor is it the first. More than 20 hypertext-inspired applications exist, according to sources at Hewlett-Packard Co. and Xerox Corp.

Perhaps the best known commercial products are Guide from Owl International, Inc. of Bellevue, Wash., and Notecards from Xerox's Palo Alto Research Center (PARC) in California. A well-known research version is Xanadu, an ambitious project led by Nelson and the Project Xanadu group in San Jose, Calif.

Each product basically serves as a system for storing and managing information in a variety of formats, including text and graphics files, audio, laser disk and compact disk/read-only memory (CD-ROM). For example, Xanadu shows the origin of every byte within the system and keeps track of everything as filing matter, Nelson says. Additionally, Xanadu was designed to use existing relationships between data to create new ones.

Hypertext is not limited to a linear form but rather enables a person to look at a collection of ideas and then pull them together in ways that describe the relation or association among them.

While commercial products share some basic hypertext concepts, they are not in the same arena as Xanadu, Nelson claims. "The developers are going in the right direction, but [true] hypertext is far beyond their products." Even among each other, software such as Notecards, Guide and Hypercard display certain significant differences.

Xerox's Notecards, available for more than two years, is the oldest of the three products. Several PARC researchers, who read Nelson's book, *Computer Lib*, decided they should "try to do something" concerning hypertext, recalls Daniel M. Russell, a member of PARC's research staff. In October 1983, one of those researchers, Frank Halasz, took 1½ weeks to create a prototype of what was to become Notecards. A year later, PARC delivered the finished version.

Unlike the Owl and Apple products, Notecards was not designed for micros. Based on Xerox LISP (formerly Interlisp-D), Notecards runs on Xerox 6805 workstations and Xerox 1100 artificial intelligence machines. The hypertext-based software is an interface of function calls and data structures for Xerox LISP, and it is tightly coupled with the language, Russell explains.

As a result, Notecards is a more powerful product than Hypercard, he maintains. "The interaction between Xerox LISP and Notecards makes it very easy to do changes," Russell says. For example, he notes, "I only took an hour to add video support to Notecards." Russell could use Apple's Hypertalk, the language behind Hypercard, to perform the same task, he says, "but I couldn't do it in an hour."

Owl's Guide software is the second oldest hypertext product, and it is the first one designed for micros. Version 1.0 of Guide for the Mac and IBM Personal Computer have been available since September 1986 and June 1987, respectively.

Unlike Notecards, Guide's development primarily grew out of the need to manage the huge amounts of data stored on CD-ROM disks, says Alan Boyd, Owl's president. In early 1985, Guide's developers came to Boyd, who was then the manager of product acquisition at Microsoft Corp., with an early prototype of Guide. "Microsoft was not interested in CD-ROM technology then, so I left and formed Owl International to market Guide," he recalls.

Guide Version 1.0 lacks the full range of functionality of Hypercard, but Version 2.0 matches and sometimes surpasses the capabilities of the Apple product, Boyd claims.

A key feature of Version 2.0 of Guide for the Mac, available since October, and Guide for the PC, due out this month, is the command button. Like the buttons in Hypercard, the Guide buttons allow users to control applications by clicking on an icon within a Guide document. In the PC product, this capability is limited to those programs running under Microsoft Windows.

One visible difference between Hypercard and Guide is price. Apple is bundling Hypercard in with new Macintoshes and is selling the product for $49 to current Mac users. Guide Version 2.0 sells for $275. However, the price difference should not hurt Guide's sales, Boyd predicts. In fact, "Hypercard already has had a positive effect on Guide sales for the PC and the Mac because it has brought attention to our product," he says.

In the Microsoft MS-DOS PC arena, Guide has no other competitors, Boyd notes. At the same time, Guide's smaller memory requirements make it the only option for Macintoshes with less than the 1M byte of random-access memory Hypercard requires. "Guide runs on 512K bytes, and there are a lot of Macintoshes with only 512K bytes," Boyd says. Also, some Mac users do not like the limited size of the cards in Apple's Hypercard. Instead of a card format, Guide uses a document format that can be altered in size.

But among the hypertext-type products on the market, the latest and best known is Apple's Hypercard, available since August. Officially, Hypercard was not influenced by hypertext. However, descriptions of Hypercard's information storage and management capabilities resemble those of Nelson's generic concept.

It is known that Hypercard developer Atkinson saw a demonstration of Xerox's Notecards in June 1986, leading to speculation that Apple borrowed from Notecards. Xerox's Russell says there is no basis to that rumor. "Atkinson had been working on Hypercard for two years before he saw Notecards. The demonstration only confirmed that he was on the right track," he says.

Apple's description of Hypercard as a personal tool kit is appropriate. The hypertext-like information management functions are only a component of the product. Other tools or components include stacks for an address file, date book, to-do lists, calendars, filing system, stack templates, card designs, clip art drawings and on-line Help. Hypercard also provides paint capabilities more sophisticated than those of Apple's Macpaint application, Atkinson claims.

A well-chosen analogy for Hypercard and its uses comes from Atkinson, who says the product is like an Erector Set. As with an Erector Set, Hypercard comes with a collection of pieces and some guidelines for creating things with those pieces. A person may first follow the set's directions for building a truck but then begin to alter the shape of the truck or build something else entirely, Atkinson explains. Hypercard users will follow a similar pattern in learning to use the software, he says.

The ability of products such as Hypercard, Guide and Notecards to represent and manipulate information in an associative manner is nice, many DP and business managers say. However, because the focus of microcomputer products such as Hypercard and Guide has been on the applications' utility in developing educational programs, managers question the applicability of these hypertext-type offerings in the corporate office.

However, hypertext-based applications for businesses already exist, and many more are in development. Among the third-party applications announced for Hypercard are Phonenet Manager from Farallon Computing, Inc. in Berkeley, Calif., and Focal Point and Business Class, both from Activision, Inc. in Mountain View, Calif. These three products will not be released until the end of 1987.

Phonenet Manager allows a network administrator to manage and maintain multibuilding Apple Appletalk or Ethertalk networks from a central office.

Focal Point is a time and information management application that can link to other Hypercard stacks. It includes a daily appointment calendar, phone dialer, incoming and outgoing phone log, address book, expense report and notepad.

Perhaps the most interesting application to management, though, may be Activision's Business Class, an electronic travel assistant that provides an interactive itinerary planner and various information about 63 countries. The application is aimed at business people who travel or the people who work for them, says Dick Lehrberg, Activision's vice-president of product development.

Off to London

As a user, Lehrberg can provide personal examples of how to use Business Class. "When I go to London, I can look at the time differences between here and London. I can check the monetary system and do a dollars-to-pounds conversion. Business Class tells me which airports serve London and the types of transportation running between them and the city. The package also provides names and phone numbers of hotels and hospitals," he says. Business Class also provides information on social customs, Lehrberg adds.

Other corporate applications of hypertext include custom packages. One of the largest of these custom projects is an automobile troubleshooting system that Palo Alto, Calif.-based Hewlett-Packard is designing for Ford Motor Co., headquartered in Detroit.

Using Owl's Guide for the PC, HP has developed an on-line instruction software module that works with other diagnostic modules to help Ford mechanics locate, identify and repair cars.

The HP auto diagnostic system was designed to solve two problems, according to Lu Kabir, HP's program marketing manager for automotive diagnostic systems. First, it will give mechanics access to information to which they previously had limited access because it was stored on paper or microfiche, he notes.

Second, the system will help mechanics diagnose problems in electrical, microcomputer-controlled components, which few have been trained to repair.

A primary function Guide has given to the on-line manual is allowing mechanics to quickly access information at the level of detail they need. "A mechanic with two years of experience can start at a basic level and have the software guide him through the repair," Kabir explains. "A more experienced mechanic just needs the software to point where the problems are."

The diagnostic applications run on the IBM Personal Computer AT-compatible HP Personal Vectra, which has a color graphics adapter color touch-screen monitor. These Vectras can use information stored on CD-ROM disks or communicate with Ford's system of mainframes. By September 1988, HP hopes to begin installing systems in Ford's 6,000 North American dealerships, Kabir says.

On a smaller scale, application vendors or information center managers can use hypertext products such as Guide or Hypercard to develop software for marketing or training. For example, Gretchen Whitney, special projects manager for Ann Arbor, Mich.-based Personal Bibliographic Software, Inc., has developed Pro-Cite Explorer.

Pro-Cite Explorer teaches users or potential clients about the functions of Pro-Cite for the Macintosh, a bibliographic data base management system. Pro-Cite Explorer also has turned out to be an entry-level tutorial for Pro-Cite users as well. Because users can switch easily between Pro-Cite Explorer and their Pro-Cite file, "It's as if someone is there showing you how to use the software," Whitney claims.

Amid the hype over today's hypertext-based products, users must also be aware of the limitations. One misconception is that these products can replace relational data base management systems, Xerox's Russell says. "The structured data elements allow users to perform complex queries," he explains. Because hypertext does not support such structuring, it cannot handle complex queries.

However, hypertext provides the basis for creating a data base that is very malleable, Russell says. "You lose some capabilities, but it allows you to create a personal data base structured the way you think."

Another common misperception is that hypertext-based systems are somehow automatic, says Esther Dyson, editor and publisher of "Release 1.0," a New York-based software industry newsletter. "Hypertext represents thoughts; it does not create them," she explains. "Hypertext assumes that there is a person at the other end."

Given an understanding of the boundaries of hypertext-inspired products, users and software developers alike may find the offerings' potential applications almost limitless. "With hypertext, you can do anything," Dyson asserts. "But you have to do it." ◆

The PS/2 dilemma

A bird in the hand...?

BY PHILIP J. GILL

IBM's second-generation desktop computer family, the much-heralded Personal System/2 line, is far from encountering the runaway success of the original IBM Personal Computer, otherwise known as the "PC Classic." In fact, the PS/2 and its forthcoming operating system, OS/2, are looked upon with a great deal of skepticism and ambivalence by some MIS professionals and are rejected outright by others.

As many MIS professionals see it, IBM's PS/2 line of advanced desktop computer systems, introduced last spring with much fanfare, raises many confusing, perplexing and challenging issues yet to be faced in the PC world.

"It's one of the first things [MIS directors] talk about when they get together these days," says Dennis Lockard, manager of advanced information technology at Corning Glass Works in Corning, N.Y.

In the long term, analysts claim, the course for most users is settled. "Many companies are standardizing on the PS/2, particularly the Model 50s and 60s," says George Colony, president of Forrester Research, Inc., located in Cambridge, Mass. "If you don't, you will miss out on the high performance of the new operating system, the new applications and the new user interfaces the systems will offer," he claims.

MIS directors generally agree that the move to Intel Corp. 80286- and 80386-based systems is the right move — in fact, they say, it is precisely the direction in which they were moving with or without the PS/2's influence.

Nevertheless, reservations about the PS/2 line abound, and MIS concerns center on the following five areas.

• **Price/performance.** The current lineup of PS/2s does not impress most MIS directors as possessing any particular price/performance improvements or advantages over the current crop of 286-based IBM Personal Computer ATs and clones and 386-based systems. This assessment is especially important now that Compaq Computer Corp. has introduced its 20-MHz 386-based systems, the Portable 386 and Deskpro 386/20.

Most MIS managers dismiss the PS/2 Models 25 and 30 outright as inconsequential; they say these machines are intended for those users and companies that plan never to leave the Microsoft Corp. MS-DOS world. The Models 25 and 30, they say, are useless to any user or organization that plans to move to the forthcoming OS/2 operating system, co-developed by IBM and Microsoft, or any other advanced operating system.

The next two members of the PS/2 line, the Models 50 and 60, are also looked on as poor price performers. Many 286 clones and some 386 systems offer virtually all the same features and capabilities (except the Micro Channel bus) at a lower price.

As for the PS/2 Model 80, the top-of-the-line 386-based machine, this PC is considered

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overkill for most commercial users today, MIS managers say.

Steve Ikard, a San Francisco local-area network (LAN) consultant and former member of the PC support organization at Wells Fargo Bank, NA, one of the U.S.'s 10 largest banks, offers an assessment of the PS/2 family that most other MIS professionals share.

"I dismissed the Models 25 and 30 right away," he says. "The Model 50 comes pretty close to the 286 clones in price, but it only has a 20M-byte drive, and it's slow. Thirty megabytes is our absolute minimum these days; I would probably recommend putting in 40M bytes. IBM really missed the boat with the Model 50.

"I can get some really good 286 machines for a lot less than a PS/2, even with a corporate discount. I can get all the features of the Model 60 [in a 286 clone] except for the Micro Channel bus. To me, the Micro Channel bus isn't worth the extra money right now."

STEVE IKARD
INDEPENDENT CONSULTANT

"The Model 60 is what I'd really like to get, but it's too expensive," Ikard says. "The Model 80 — I'm holding off on that. We have no need now for a 386 machine because we're not into engineering and computer-aided design and manufacturing and we're not into large spreadsheets. Some people are recommending the Model 80 as a LAN server, but what they overlook is that disk I/O is the real bottleneck. A LAN server just does disk I/O all day long. For that, a 286-based machine is just fine."

• **Operating systems.** The lack of an advanced operating system to take advantage of the full power of the PS/2 hardware platforms is another concern of many in MIS.

Moreover, some MIS professionals express strong doubts about the ability of Microsoft to stick to its schedule for OS/2 delivery.

In addition to the skepticism about OS/2's timetable, there is a pronounced reluctance by MIS to be the first on the block to buy OS/2, which promises to be a large, complex operating system.

• **Multitasking.** One of the as-yet-unfulfilled promises of the PS/2 is the multitasking capabilities of the OS/2 operating system. But many MIS professionals maintain that the majority of their users simply do not need a multitasking operating system and would not know what to do with one if they had it.

"There are other ways of getting multitasking, such as Unix and the various presentation managers," Corning's Lockard explains.

Besides, Ikard says, most users do not need multitasking today. "Out of 100, maybe five [need the capability]," he estimates.

• **Applications Software.** MIS directors question the value of both the PS/2 hardware and OS/2 operating system when there are no applications capable of exploiting the system's resources.

• **Connectivity.** MIS is also concerned about the PS/2's lack of connectivity to existing LANs and host systems brought on by the unavailability of third-party add-in boards for the PS/2 line.

Moreover, most see these limitations as more than temporary inconveniences. The most optimistic MIS managers see a two- to three-year wait for full-fledged PS/2 systems, with some saying that they don't expect the PS/2 family and OS/2 operating system to be more than just IBM promises and statements of direction for four to five years.

Just can't wait

With lead times like that, many MIS departments simply cannot wait for IBM, and its ally Microsoft, to start delivering on their PS/2 and OS/2 promises. Instead, MIS professionals are devising both interim and long-term strategies based on equipment that is available to them today.

The doubts harbored by MIS are leading some organizations, including large users such as San Francisco-based Wells Fargo to forgo the PS/2 family, at least for this round.

The bank recently finished a thorough assessment of current PC technology, which included the PS/2, and while the institution decided to standardize on Intel's 80286 and 80386-based systems, it did not opt for the machines from the IBM PS/2 line to fulfill its needs.

Consultant Ikard explains that, in theory at least, the PS/2 is the right technological direction for the bank and many other large users because 286- and 386-based products provide the powerful hardware platforms many users increasingly need.

However, he adds, in their current state, the PS/2 machines bring little to the market that other manufacturers cannot provide, usually for substantially less money.

"I can get some really good 286 machines for a lot less than a PS/2, even with a corporate discount," Ikard claims. For $1,500 less than the Model 60's $5,295 to $6,295 price tag, he adds, "I can get all the features of the Model 60 [in a 286

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clone] except for the Micro Channel bus. And to me, the Micro Channel bus just isn't worth the extra money right now," Ikard claims.

The Micro Channel is the 32-bit system bus that forms the backbone of the PS/2's architecture. Among other things, it reportedly will enable users to perform multitasking and multiprocessor operations on a PS/2.

However, these capabilities alone are not enough for Ikard to recommend a full-scale switch from the classic architecture of the original PC, PC XT and AT and their clones to the PS/2 family.

Corning Glass Works has also decided not to install the PS/2, at least for the time being. The company's standard office desktop computer is the Compaq Deskpro 286.

"We're not installing any PS/2s right now," Corning's Lockard says. "There are a number of reasons. One practical reason is that we can't connect PCs to our most common network, which is Digital Equipment Corp.'s Decnet."

A short-term barrier

"Connectivity is a practical, short-term barrier," Lockard adds. "There are no add-in boards that we need. We have a lot of PCs hooked into DEC Ethernet LANs, and DEC has a nice board for the standard chassis that accomplishes the goal very nicely." According to Lockard, most other add-in board manufacturers are temporarily in the same boat, presenting major connectivity and communications problems for organizations.

The decision not to go with the PS/2 at this time is part of a broader strategy at Corning Glass to standardize its host systems and networking on a non-IBM vendor, namely, DEC. The PS/2, in Lockard's assessmeot, is a good move for IBM and those users devoted to IBM, but not necessarily for others.

"For IBM, the PS/2 is the necessary hardware platform for its future office software — if it ever gets its act together," Lockard states.

Even in companies that currently are leaning toward buying the PS/2, the managers say they see the commitment as a long-term, strategic one. These companies plan to go with the PS/2, but in a three- to five-year time frame.

One organization that says it sees the PS/2 as part of its long-term technology strategy is American President Companies, Ltd. in Oakland, Calif., a $1.5 billion diversified transportation firm with interests in shipping lines, railroads and containers. A large IBM mainframe shop with several IBM 3090 mainframes at work, the company looks to the PS/2, combined with the OS/2 advanced multitasking operating system, as a long-range, strategic platform for migrating mainstream business applications.

"The PS/2 smacks of not being a personal computer anymore," says Don Doss, senior technology planning analyst at American President. PCs, he explains, traditionally are low-end small machines designed for "personal diddling" to support one's job.

In contrast, "We're discovering and looking at [the PS/2] as a platform for business applications" that will directly support the main business of the company, Doss says.

In fact, Doss says he believes that the PS/2 family represents a viable hardware platform for truly distributed, cooperative processing applications.

But again, that evaluation is a long-term assessment of the PS/2, not a short-term plan of action. Today, American President has only a few PS/2s in-house, including one in the MIS shop used for study and evaluation. Any large-scale commitment to the PS/2 family is still far off, Doss admits.

> **"Our game plan is that we are going to put [PS/2s] in slowly. We're not going to displace old systems for PS/2s."**
>
> JOHN WADE
> NORTHWESTERN MEMORIAL HOSPITAL

Northwestern Memorial Hospital in Chicago is taking a middle-of-the-road approach, neither outright rejection nor wholesale endorsement of the PS/2 as an organizational standard.

"Our game plan is that we are going to put them in slowly," says John Wade, the hospital's director of information systems. "We're not going to displace old systems for PS/2s."

Instead, the hospital anticipates that it will seed its population of some 270-plus desktop PCs with PS/2s. These machines will only go to advanced users requiring the horsepower the PS/2s offer and will not be standard replacements for its current standard, the Hewlett-Packard Co. Vectra, which is a PC AT compatible.

According to Wade, "The PS/2, for the most part, is more than we need. It's not something we're going to put on every desk. And MS-DOS isn't killing us at this time. So you have to ask yourself, 'Is it worth the additional price and overhead?' We're not sure yet."

For Wade, like the rest, the PS/2 remains more a future promise — and a doubtful promise at that — rather than an immediate solution.

"I don't see where IBM brought a hell of a lot more to the party," Wade says. "I would hope that some of the products yet to come are going to make [the PS/2] worthwhile." ✦

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Circle Reader Service Number 9

PC graphics project a new image

BY REBECCA HURST

KENT SMITH

What is the latest and greatest trend in desktop applications? Publishing? No, that borders on passe. The new word is graphics. Desktop presentation graphics systems will become a much bigger market than desktop publishing is or ever will be, according to Microsoft Corp. and Apple Computer, Inc. Admittedly, both vendors have an interest in making this prediction come true. At the Seybold Desktop Publishing Conference in September, Apple announced that it was dedicating development and marketing resources to desktop graphics. Microsoft used the conference to introduce its presentation graphics product, Power Point.

Vendor campaigning aside, personal computer graphics applications and output devices are grabbing the attention and pocketbooks of such Fortune 1,000 companies as Whirlpool Corp., General Electric Co., American Express Co., Mobil Corp., Pfizer, Inc., Westinghouse Electric Corp., General Motors Corp., Eastman Kodak Co. and Blue Cross/Blue Shield.

The use of business presentation graphics is not new to such companies, remarks Joan-Carol Brigham, manager of electronic publishing research at International Data Corp. (IDC), a Framingham, Mass.-based research firm. Traditionally, though, producing them has been slower and more expensive.

Corporations have invested large sums in business presentation materials because the benefits they provide justify the costs.

These benefits include the ability to sway business decisions, shorten the time that managers require to reach decisions and improve the audience's impression of the presenter, according to a 1980 study by the University of Pennsylvania's Wharton School in Philadelphia.

The study, which looked at the effectiveness of overhead transparencies, determined that more individuals decided to act on the recommendation of the presenter who used overhead transparencies than on the recommendation of the presenter who did not.

It also revealed that groups that listened to presenters using transparencies took less time to reach a consensus decision. Finally, the university study determined that the presenter who used transparencies was perceived aa significantly better prepared and more professional, persuasive, credible and interesting than the presenter who did not use them.

Managers at Pfizer, a New York-based pharmaceutical firm, understand that good-looking presentations are important to upper level management, says Leslie Gilbert, Pfizer's videographics manager.

For example, he says, "One department asked me to give them a presentation about presentations." The department's managers wanted to learn how to make their business presentations look better and appear more authoritative and important, Gilbert explains.

Graphics presentation requirements are emphasized perhaps even more at the Methodist Hospital System in Houston. "We are the Nieman-Marcus of hospitals. We have a lot of celebrity patients, and our whole image is first class," says Karenn Wahl, executive assistant to the president of Methodist Hospital. As a result, she asserts, "Everything we do has to be first class. Using a typewriter to create even an internal report is not acceptable."

In fact, the transparencies and handouts typed or printed on an impact printer that many companies considered very professional looking in 1980 seem slipshod by today's standards. The emerging presentation standards include high-resolution color graphics for pages, transparencies or 35mm slides. The drive behind these standards appears to be coming from two areas — desktop publishing and improved technology. Together, these factors are pushing large and small companies toward desktop graphics systems.

Desktop publishing has caused people's quality standards for publications to rise, analysts say. "Newsletters printed with a letter-quality impact printer were acceptable a few years ago," recalls Pamela Bliss,

Hurst is *Computerworld Focus*'s senior writer.

an office systems research analyst for Dataquest, Inc., a San Jose, Calif.-based research firm. "Recently, someone told me that my newsletter would look more professional if it was set on a laser printer," she says. This awareness of quality has carried over to business graphics, analysts and corporate managers agree.

To the desktop

A more significant factor is the technology that has brought high-quality presentations to the desktop for both business graphics and publishing. "There are a number of parallels between graphics and publishing," IDC's Brigham notes. Low-cost laser printers and IBM Personal Computer and Apple Macintosh applications have brought publishing and graphics from minicomputers and mainframes to the desktop.

Additionally, affordable 35mm slide makers are enabling more businesses to bring slide production in-house.

Personal computer graphics software is allowing the communications department at Blue Cross/Blue Shield of Maine to create 35mm slide graphs in a fraction of the time it used to take to do them by hand, reports Ernie Jurick, administrator of technical writing for the Portland, Maine-based insurance company. Jurick has used Kinetic Layout software from Kinetics Presentations, Inc. of Louisville, Ky., for more than four months. "It really spoils you," he notes. "I can't imagine going back to the old way."

The old way was a hand process that involved cutting acetates to designate color separations. "It took about three hours to create each slide, and that was only if everything went right," Jurick recalls.

In contrast, he recently used Kinetic Layout to create 10 slides showing the part Blue Cross/Blue Shield will play in the 1988 Olympics. The whole set of slides took about two hours to complete, he says.

Highly flexible, easy-to-use graphics packages also have made the personal computer graphics tools that came out four years ago obsolete, Methodist Hospital's Wahl notes. "The charts and reports I created in 1983 were considered outstanding then. Today, they seem almost childish," she says.

For example, a chart created with older business graphics software only permitted a 40-character, centered headline, according to Wahl. Using Lotus Development Corp.'s Freelance and Graphwriter packages, she now determines the length and positioning of labels and headlines.

"We are doing things differently and a lot easier than we ever thought we would," she claims.

> **"The charts and reports I created in 1983 were considered outstanding then. Today, they seem almost childish."**
>
> KARENN WAHL
> METHODIST HOSPITAL

The best graphics applications or combination of packages provide text- and graphics-handling capabilities, analysts and users agree. While many managers think of graphics when they think of presentations, text often plays a greater role. "Nearly four out of five transparencies are text," according to Larry Daniele, vice-president of research and development for Advanced Graphics Software, Inc., a graphics software manufacturer headquartered in Mountain View, Calif.

A study in the mid-1970s by MIT's Sloan business school discovered that 80% to 90% of the bullet charts used in presentations are textual, Brigham says. However, she notes, "Business graphics are very important because they provide a concise way to present information." Graphics also shorten the learning curve, Brigham adds.

These learning advantages are encouraging some organizations to move the emphasis from textual slides to ones using graphics. For instance, Pfizer's slides used to be split evenly between text and graphics, Gilbert reports.

"Now 60% of our slides are graphics, and the emphasis on graphics is growing," he says. Only new managers or managers with product launches use slides that are up to 90% text, he notes.

In addition, companies that present a lot of numerical information require greater graphics capabilities. For example, at the Methodist Hospital, Wahl regularly uses charts to represent budgeting, analytical and statistical figures.

"My audience is the president, three executive vice-presidents and five senior vice-presidents, and they want to get an analysis in summary form," she explains.

"With the charts, they can spend less than five minutes to get an understanding of the situation," Wahl says.

Many graphics package users also want artwork. "Illustrations make a presentation more interesting to the audience," Dataquest's Bliss explains. Professional artists may require draw or paint capabilities so that they can create images freehand. Other users prefer clip art, Bliss says. "Clip art illustrations are important because most people are not artists," she explains.

All that jazz

Graphics software should also balance ease of use with flexibility. "I like to jazz up charts by making them bigger or by combining two into one," Wahl comments.

While she uses Lotus Graphwriter to create the charts, she moves to Freelance to make artistic changes. "I can do the changes in Graphwriter, but it's easier and faster in Freelance," she explains.

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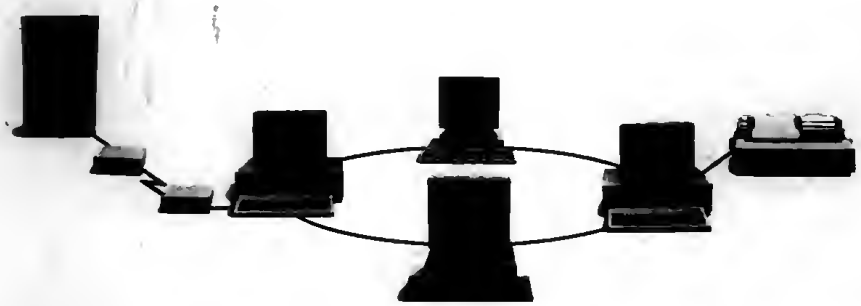

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As if saving you time and memory wasn't enough, RabbitGATE also saves you money. It's priced competitively, yet offers unique

GRAPHICS UPDATE

Sometimes getting a balance of ease and flexibility can be difficult, though. "Kinetic Layout is flexible and allows me to be creative," Blue Cross/Blue Shield's Jurick says, but the application requires him to go through several operations to handle certain functions. "It's almost a Rube Goldberg machine," he notes. Jurick also tried Harvard Graphics from Software Publishing Corp. in Mountain View. "It's very easy to use, but the creativity is almost zero," he claims.

Finally, most companies using presentation graphics software require templates. Templates increase productivity, according to Alan Greif, a principal of the business consulting firm Booz, Allen & Hamilton, Inc. who runs the firm's Bedford, Mass., office.

Laying out the design by hand takes a long time, he says. "With a template you can just pour the information into the format very quickly."

No time to decide

Templates are particularly important for business managers, according to George Meyfarth, vice-president of marketing for Business & Professional Software, Inc., a Cambridge, Mass.-based developer of presentation graphics software. "Most managers are up against a time deadline. They don't want to make a lot of design decisions," he explains.

Beyond convenience, templates provide a means for ensuring the quality and consistency of graphics presentations. "No matter how beautiful a slide is, it needs to present a unified message," Dataquest's Bliss says. Because templates relieve users from the chore of defining graphics elements for each slide or transparency, the ability to use templates is important for presentation novices, she notes.

However, advanced users also find templates convenient. "I don't want to have to remember what type styles I use from one slide to the next," Bliss explains.

In addition to graphics packages, users rely on specialized output devices to create graphics presentation materials. For transparencies and documents, the standard device is a thermal-based color printer with a resolution of 280 to 300 dot/in. Companies that provide such printers include Mitsubishi Corp. and Tektronix, Inc. Color-printed presentations are good for sales representatives because high-quality color gives potential customers the impression of maturity and financial stability, Booz Allen's Greif says.

However, managers may be more receptive to black-and-white graphics for internal presentations, he warns. "Color doesn't cost more, but people's perceptions have not caught up with reality. If you use color, you may be accused of gilding the lily."

"No matter how beautiful a slide is, it needs to present a unified message."

PAMELA BLISS
DATAQUEST, INC.

While transparencies and handouts are acceptable for smaller meetings, larger presentations generally demand high-quality 35mm slides. Within companies such as Blue Cross/Blue Shield and Pfizer, slides have cost $50 to $100 apiece. Using PC-based graphics software with low-cost slide machines or services has brought that cost down to $10 or $15.

At Blue Cross/Blue Shield, Jurick uses a modem to send slide graphics he has made with Kinetic Layout to Kinetics' slide-making laboratory in Kentucky. The lab develops the slides and sends them back via Federal Express so that they arrive the next day. "Now we can almost create slides as an afterthought," Jurick says. "We sometimes send them 24 hours before a show."

However, Blue Cross/Blue Shield is talking about getting its own 35mm slide film recorder next year, Jurick reports. "Owning a film recorder gives us more control over the production end," he explains. "We won't have to rely on the modem or Federal Express."

Jurick, who has created at least 500 or 600 slides since March, says the volume justifies the cost of the film recorder.

Slide film makers or recorders come in a variety of models and prices. At the low end are products such as Cambridge-based Polaroid Corp.'a Pallette, which costs less than $5,000. Other systems, such as those from Waltham, Mass.-based Autographix, Inc., can cost up to $100,000 for high-end models.

Pfizer uses slides, but it also goes a step further and uses Berkeley Calif.-based General Parametrics Corp.'a Videoshow graphics display device for many of its presentations. To use Videoshow, users copy their PC-based graphics onto a floppy disk and insert it into the microprocessor-based Videoshow device. Users can then display high-resolution graphics images, or "slides," on a screen.

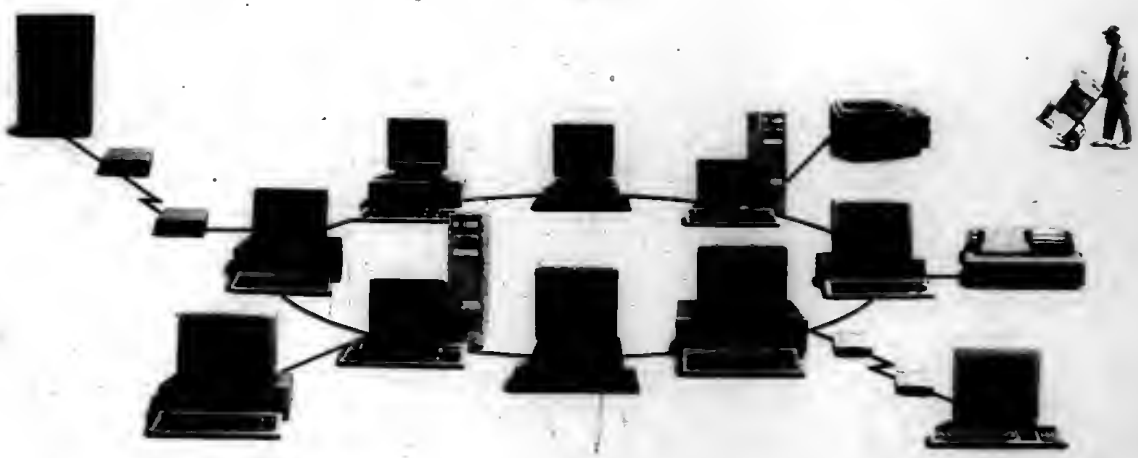
Flexible floppy

Because the slide images are stored on a floppy, users can access them in a predetermined order or change the presentation to reflect the direction of discussion at a meeting. "Videoshow is our standard presentation device," Pfizer'a Gilbert says. "It gives the presenter a lot more control than a slide projector."

Despite the variety of output devices available, managers should not forget the soft-copy alternative, Greif advises. A graphics display on a good-quality PC screen can cost-effectively display data that will change tomorrow, he explains.

Whatever media managers choose, they cannot afford to ignore the strategic importance of graphics presentation systems, both analysts and users agree. "Companies almost don't have a choice," Jurick asserts. "They can't afford to go any other way."

Yet.



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Circle Reader Service Number 10

THE ANALYST WHO KNEW TOO MUCH.

What drove this man to build a spreadsheet 1,000 lines deep?

Recently, a financial software ad appeared in the Wall Street Journal under the headline: "When I told my friends about this ad they said, don't do it, Bob." It featured C. Robert Tully, for 15 years a vice president and chief financial officer of the $3 billion Celanese Corporation, and it caused quite a stir.

We can still send you a copy of that ad if you missed it. (Just give us a call.) But today we'd like to share with you the story of a Fortune 500 company that uses the product Mr. Tully risked his reputation over.

It is a story well worth reading. It will help you answer questions your CFO will probably ask you. It could help you save your company money. And it could help you rescue your company–like the MIS executive below did for his–from "the analyst who knew too much."

You will also learn about a new advanced financial software product called FASTAR, which was developed by Corporate Class Software, a subsidiary founded by the $3 billion Celanese Corporation.

Here's what happened.

The vice president of finance for a $2 billion-plus manufacturing company was worried. He had learned one of his analysts had created a monster spreadsheet 1,000 lines deep, and growing deeper by the day.

Could that be the reason for the slow analysis in his department, he wondered? Every request seemed to stall. An ad hoc request for year-to-year cost comparisons took a full day. A day! By then decisions had already been made and other problems needed attention.

What would happen if the company added a new division, he asked? Or assigned more product lines to an analyst? How much time would be lost?

TROUBLE, TROUBLE, TROUBLE.

A call to MIS was sent out for help.

The MIS chief had been around long enough to know that the monster spreadsheet was just the tip of the iceberg.

Like most companies, financial data was spread out among the divisions of the corporation. And different departments used different formats to store the data.

As a result, analysts had a difficult time accessing needed data quickly.

To make matters worse, financial analysts had created their own data empires on PCs, and many had built elaborate and shaky programs with macros. (Though none so huge as the 1,000-line monster. "It was hideous," said one programmer who saw it.)

What would you have done in the MIS executive's position?

As one observer put it: "They saw that they were heading down a funnel."

A DRAMATIC DISCOVERY.

The way out came from a company called Corporate Class Software.

This company had developed a product known as FASTAR–Financial Application Solution to Analysis and Reporting–that was the first *packaged* solution to *advanced* financial applications.

No fourth generation languages were needed to perform advanced financial applications. No macros were necessary. And all data from FASTAR could be loaded onto Lotus 1-2-3 spreadsheets for work there. (Yes, we'd be skeptical too. You'll find out how all this was done in a minute.)

When the decision was made to test FASTAR, the same ad hoc cost comparison that once took a day, now took minutes. Minutes!

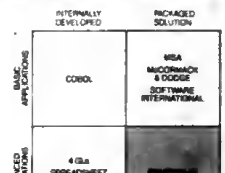
What's more, the company now had the flexibility to assign new divisions and product lines to analysts without taking time to reprogram the system. FASTAR is built to expand horizontally (for companies) and vertically (for products). In virtually unlimited numbers. The MIS executive was so impressed with FASTAR, in fact, that he now uses it to manage and analyze information from the more than 10 cost centers in his own department.

How could all this be done?

A PRODUCT THAT ALMOST DEFIES DESCRIPTION.

FASTAR acts as a bridge between PCs and mainframe financial production systems, such as the general ledger.

But it is more than a bridge. It is a ready-made solution for advanced financial applications that organizes data the same way that analysts are used to working with it–by financial schedule (income statements, etc.), by organization entity (divisions, etc.), by period (day, week, month, etc.) and by type (any fourth type of data you choose such as actual, budget or forecast). With the proper clearances, analysts can access financial information from any financial schedule for any company in the corporate structure. And they can consolidate and analyze that information without ad hoc programming. (Our powerful analysis package is built in, so there's no fourth generation language or macros programming needed. Even analysts who are computer illiterate can derive the same benefits from FASTAR as anyone else.)



FASTAR is not a tool, but a ready-made solution for advanced financial applications, including financial consolidation and management reporting

As a result, analysts can report more quickly, consolidate more accurately, and analyze more frequently than with conventional systems.

Another company found, for example, that year-end reports that used to be available in early April, just prior to the annual meeting with shareholders, were now ready in February. And consolidations that used to take two to three days now took hours–with more accurate content. (One way that we've made consolidations more accurate is through a rigorous system of data checks that automatically checks data integrity.)

BRING THE NUMBERS BACK WHERE THEY BELONG.

FASTAR also addresses the critical issue of data integrity and control.

Because FASTAR takes all programming off the spreadsheet, there are no undocumented programs to cause costly mistakes. (Think about the 1,000 line spreadsheet written by the analyst who knew too much. He was only looking for a way to speed his analysis.)

FASTAR is the backend solution to advanced financial applications that can provide quantitative and qualitative improvements in your company's financial analyses.

FASTAR also eliminates the need for passing data back and forth on pieces of paper and having secretaries or analysts type them into spreadsheets. This reduces the number of potentially dangerous errors that can occur. And because all financial information is stored in FASTAR'n data base, MIS executives regain control of critical data.

You also protect all of your company'n investments. FASTAR accepts data from fourth generation language products and database management systems, as well as microcomputer applications.. (None of the companies using FASTAR needed more than three days to adapt the program to their corporate needs.)

In the final analysis, MIS executives show themselves to be strategic thinkers by giving analysts a tool to be more productive. (Did you know that one company found that 85 percent of an analyst's time is spent just looking for data?)

LET'S TALK.

You can see why financial professionals are interested in FASTAR. And why the chief financial officer of a $3 billion company would put his reputation on the line to become chairman of our board of directors.

If you'd like more information about FASTAR call 212-719-8209.

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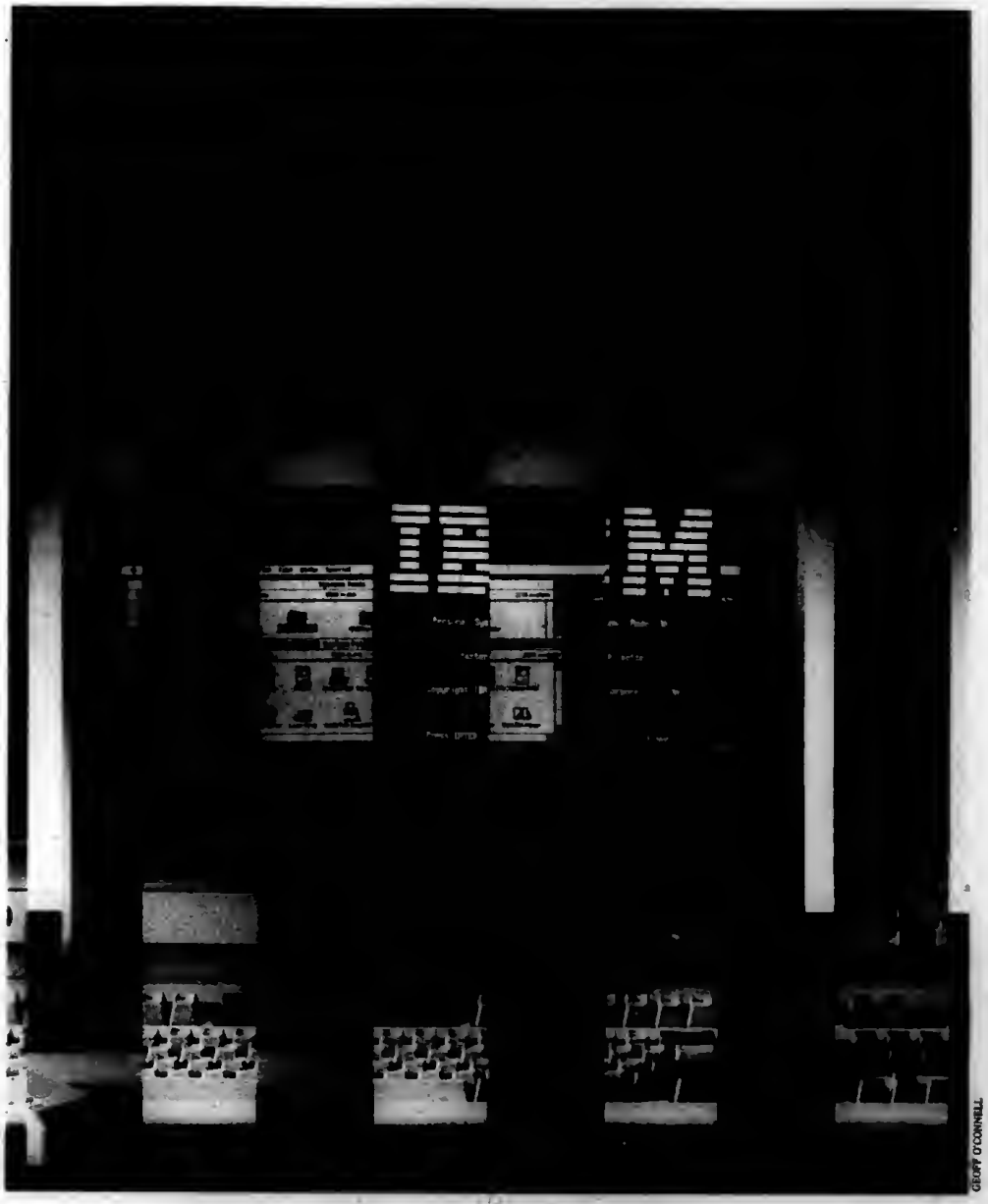


GEOFF O'CONNELL

Great expectations

BY STAN KOLODZIEJ
SENIOR EDITOR

Suddenly, computers might be entering a brave new world. Look at the power — there are now some big mass-consumer computers on people's desks. With speedy processors and connectivity options, the newest Macintoshes from Apple Computer, Inc. and the high-end Personal System/2 models from IBM promise to push the potential of personal computing to new limits.

OK, there are faster personal computers than the Mac and PS/2 models, but these machines are generally workstation-like units built for heavy data throughput and compute-intensive applications that emphasize tightly networked user groups. Not machines for the average office worker.

In the meantime, as Apple and IBM are scrambling to make software applications and more connectivity features available for the Mac and PS/2 lines, each company is faced with a different situation.

Though the original Mac is 3 years old, it has only been during the past year that Apple and software developers have hastened to port the best Microsoft Corp. MS-DOS applications to the Mac line. Apple's recent software moves are part of the firm's pragmatic approach to coexisting with IBM in an IBM corporate world. And analysts agree that such Apple connectivity to the IBM environment has been long overdue.

"Apple is not so much racing [to connectivity] as recognizing that IBM sets the standard in corporate PC use," explains Jonothan Yarmis, a senior research analyst at the Gartner Group, Inc. in Stamford, Conn.

To play the game in big business, Apple is pushing for IBM and DEC links. Page 33.

John McCarthy, director of the Professional Automation Service at Cambridge, Mass.-based Forrester Research, Inc., says he believes that once the

Extended Edition of IBM's OS/2 operating system arrives, "IBM will bully Apple, using the communications options of the new operating system as a club."

Shrewd moves

"Apple has to do something more innovative now in the way of data base software and networking to extend its connectivity options," McCarthy says. He points to Apple's recent investment in data base software developer Sybase, Inc. as a shrewd move because Sybase can provide a necessary bridge between Apple and the growing market surrounding IBM's SQL data base query language.

McCarthy also says Apple would be well advised to fine-tune its Communications Framework architecture to IBM's ambitious Systems Application Architecture (SAA), which is aimed at providing common programming interfaces, user interfaces, sets of applications and communications support across all IBM systems. McCarthy says that an Apple workstation, said to be under development in Apple's laboratories, might have some built-in SAA elements.

IBM has a separate set of priorities. Although the firm has positioned its flashy Intel Corp. 80386-based PS/2 Model 80 as the flagship with which it aims to carry users into the next decade of personal computing, the machine has virtually no software, nnt even an operating system.

Applications for IBM's OS/2 operating system are not slated to appear until the end of 1988 at the earliest. Microsoft, co-developer of OS/2, is reportedly working feverishly with software developers to get the kinks out of OS/2 and to ready an array of third-party applications that will take advantage of the OS/2's multitasking and the PS/2's vaunted Micro Channel bus architecture.

Until then, IBM is busy playing evangelist and asking users to have faith. IBM wants them to purchase the PS/2 Model 80, run existing MS-DOS programs on it and wait until OS/2 and software can really kick the PS/2 into full gear.

Many users, however, say they see IBM's actions as hardware overkill. And these users are probably right; IBM seems to be saying, essentially, that the Model 80's 386 processor should run as a fast Intel 80286 to take advantage of current software applications.

When OS/2 becomes available, however, the operating system will also run programs in protected mode on the 80286 processor. In the protected mode, OS/2 can provide multitasking. OS/2 running on the 80286 processor will also enable programs to use the full 16M-byte address space of the 80286 processor. This ability will surmount the pesky 640K-byte address spaee barrier of the IBM Personal Computer's Intel 8088 processor, to which most of the current PC software pngrams are still tied.

So far, everything seems to favor the 80286 systems.

IBM obviously feels there is still a lucrative market in its 80286-based Personal Computer AT family. This year, it introduced several 80286-based models while also announcing that it was halting production of its PC lines, including, at a future date, the PC AT.

Make no mistake about it

IBM's pursuit of smooth applications and operating system transitions among its PC product lines is also no mistake; IBM is taking a similar tack with its larger systems and software. Intersystem connectivity and compatibility are now important pillars supporting IBM's marketing strategy.

By clearing out its low-end PC stock, IBM is also clearing the way for OS/2 to open the capabilities of the 80286 machines, something that MS-DOS has not made possible. Though OS/2 provides an important bridge between its 8028G- and 80386-based systems, it is also creating a 80286 unit that, in combination with fast coprocessors, massive disk-drive storage and new graphics options (which have been an essential part of the 80286 market for the past year), can make the 80286 machines powerful hardware and software systems.

However, in its haste to provide software bridges, IBM might instead be building some marketing barriers. If everything is suddenly available in the 80286 world, some people might just ask why the 80386 machines are needed. One user equated using IBM's 386 machine for everyday tasks to purchasing a Mercedes-Benz to go buy groceries.

Could IBM have unintentionally tapped an underground current of user skepticism?

Jim Weber, president of Insight Technology, Inc., a Piscataway, N.J., consulting firm, says that users simply do not need the extra oomph of the 386 processors and OS/2 software for the time being.

"Software has grown to take advantage of the 80286 processor," Weber says. "Most word processing, spreadsheet and graphics packages work about as fast as people type on the 286 machines. Speed beyond that is wasted."

IBM could have made a tactical error. No doubt OS/2 will make the 80286 fires burn even brighter, but it may also inadvertently take some of the marketing luster from IBM's 80386 machines. Yet, as one analyst points out, IBM's seemingly confused short-term strategies in the past have often made sense when played out over the long term.

IBM's OS/2 Extended Edition could be that long-term strategic key. It is with the Extended Edition that the full, distinct capabilities of IBM's 80386 machines promise to emerge. And much of that plan centers on connectivity.

Initially, IBM says its OS/2 Extended Edition will support such IBM communications facilities as LU6.2, Enhanced Connectivity Facilities, 3270 Systems Network Architecture (SNA) and Netbios. All these communications options are also part of IBM's SAA.

Support for SAA links

Beyond the initial communications support, OS/2 Extended Edition will at some point also support other scheduled SAA communications links such as IBM's Document Interchange Architecture/Document Content Architecture, X.25, Synchronous Data Link Control and Token-Ring network.

We now begin to get a clearer picture of where OS/2 components fit within SAA.

In SAA's common user interface component, for example, the OS/2 Presentation Manager, an upgrade of Microsoft's Windows graphical interface, will probably contain elements that will work within SAA.

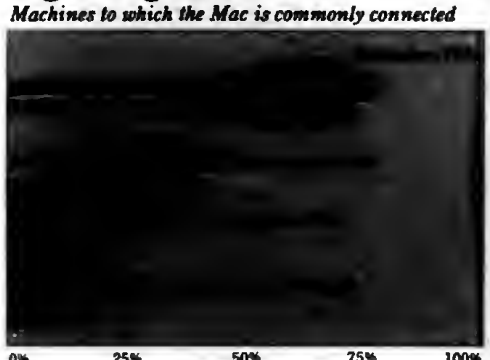
"The enhancements made to Microsoft Windows to create the Presentation Manager are likely those required to support the SAA standards," states Bruce Lynch, president of the Programmer's Shop, a consulting group in Hingham, Mass.

Lynch adds that as IBM strives to create software that is compatible with SAA, the company might also port many of its mainframe and mid-range software applications to run under OS/2. Beyond that, IBM could even be planning to bolster its mid-range systems by porting software from both OS/2 and mainframe environments into the mid-range area.

As part of the SAA format

A growing attachment

Machines to which the Mac is commonly connected



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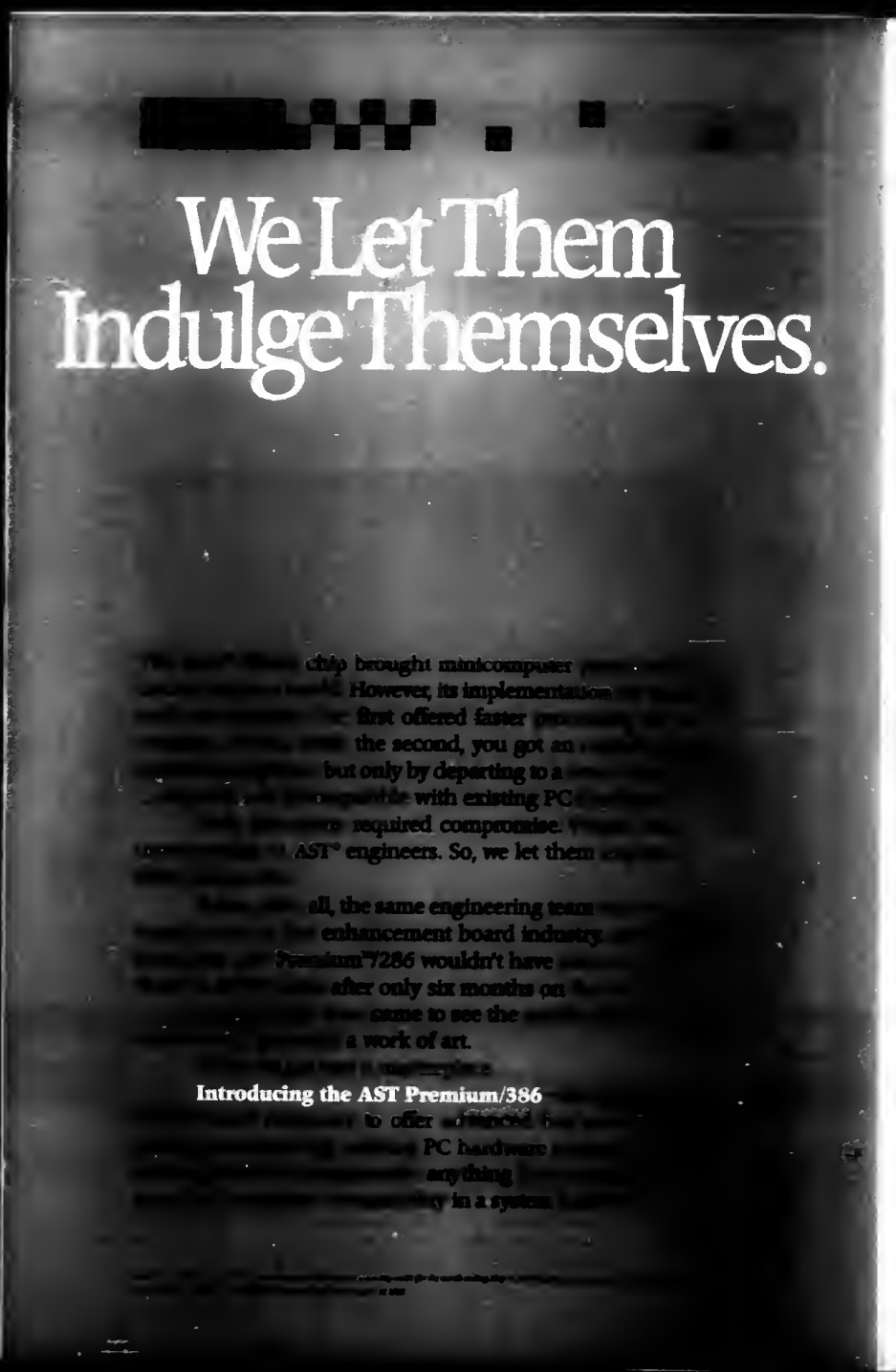
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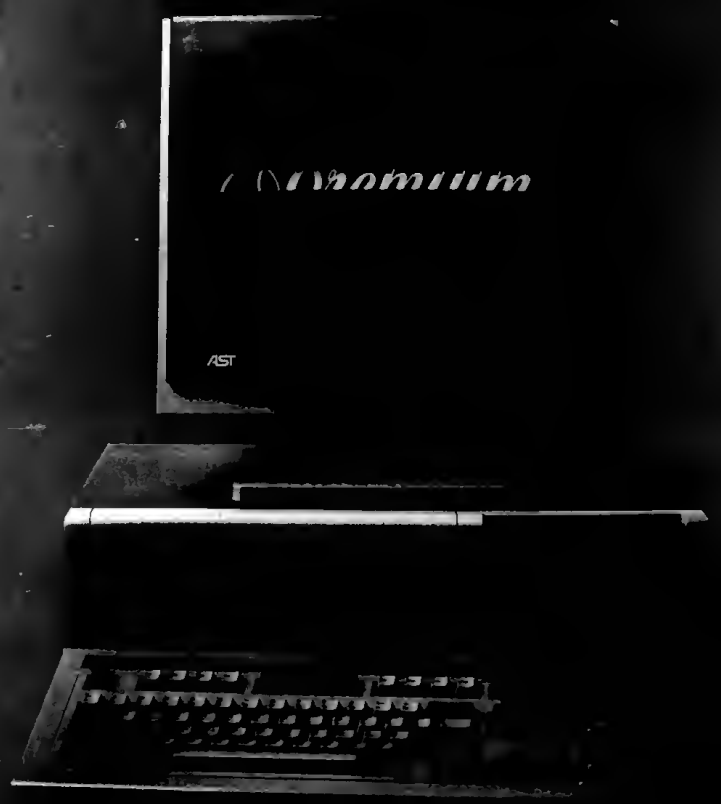

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Multimaster Bus offers ability to run concurrent hardware tasks while remaining AT-compatible. Offers key features of IBM's Micro Channel while protecting current investment in AT bus standard

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20 MHz, 80386 processor for high performance, AT-compatible desktop computing

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High-speed ESDI Bus Master Disk Controller enhances the performance of the AST Premium/386. Offers users one of the highest performing 80386-based, AT-compatible desktop systems available

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Power That Means Something Better for Everyone. The AST Premium/386 is a sigh of relief to users trying to decide whether to support IBM's* vision of the future, or remain in the industry-standard world of compatible 80386 machines.

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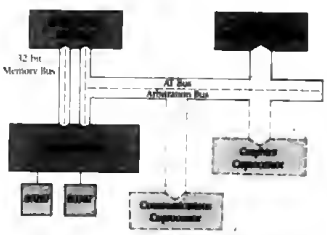
AST Premium/386 Architecture



AST's Multimaster Bus technology allows direct access to main memory for faster overall system throughput

Bus Master Disk Controller. AST's Bus Master Disk Controller actually supervises the transfer of data from its memory across the bus to the system memory without involvement of the CPU or motherboard DMA devices.

In addition to providing ST506 or ESDI compatibility and optional disk caching, AST's intelligent disk controller can be optimized to provide overlapping operations for a multitasking environment.

The Most Compatible 80386 on the Market. Best of all, you can continue to run any of your existing DOS applications on the AST Premium/386, and also take advantage of the more advanced multitasking and multiuser operating systems such as Microsoft's* MS OS/2 and XENIX*.

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Intelligent Memory Management. Up to 2 MB of memory are standard, expandable to 13 MB. Which means you have all the memory you need to multitask applications using operating environment software such as Windows™ and DESQview.™ Plus, more than enough memory to fulfill requirements of operating systems and applications in the future.

Continuing the Tradition of Unsurpassed Quality. AST customers know what to expect —the best in quality, and the best in value. The AST Premium/386 is no exception. That means building a system using the most advanced technology, including ASIC and surface-mount components. And once it's built, test after painstaking test is conducted to prove that the AST Premium/386 deserves its name.

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Microprocessor	80386	80286	80286
Speed (MHz)	20†	10, 8, 6	10
Wait States	0-1	0	1
Standard Memory	Up to 2 MB	1 MB	1 MB
Expandable to	13 MB	13 MB	4 MB
Video Adapter	Optional	VGA/EGA/HGC (most models)	VGA/EGA/HGC module
Expansion Slots	7*	7**	2
Fixed Disk	40, 90, 150 MB	20, 40, 70 MB	40 MB
Diskette Size and Capacity	5¼," 1.2 MB 3½," 1.44 MB	5¼," 1.2 MB 3½," 1.44 MB	5¼," 1.2 MB 3½," 1.44 MB

*Three software selectable speeds for timing-sensitive programs.

*One 32-bit dedicated to memory, three AT-compatible 16-bit multimaster and one 16-bit AT-compatible and two 8-bit in standard models.

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for a common programming interface, the Extended Edition promises to include relational data base management facilities based on the much-supported IBM SQL for data bases. This is an important connectivity device because SQL promises to become a major tool in the drive to form easy links among distributed data bases — something that so far has proven to be a stubborn obstacle.

Remote data base access

With SQL or a third-party SQL derivative like Oracle Corp.'s Oracle PC as a universal data extract language, PC users could conceivably scan various relational data bases residing in remote or local mainframes or minis running under IBM's DB2 data base management system. It would also make it easier for users to establish their own remote data bases.

"You can see where IBM is headed with its 80386 machines," explains Hal D'Algee, a consultant based in Davenport, Iowa. "It is going to be selling them as file servers as well as personal computers. But the whole emphasis seems to be toward IBM connecting the 386 machines into its large systems.

"Why would anyone buy a 386 machine now if they don't have a mainframe, if they aren't going to plug it into something bigger than itself? If you don't have a mainframe, you would probably want to buy a Unix-based [Motorola, Inc.] 68020 system or an Apple Macintosh II instead," D'Algee explains.

Weber says SQL's introduction into OS/2 is very significant. "Data base management systems are the next things to be integrated into OS/2," he says. "The 80386 should be part of a networking scheme. For users, a networked 80386 will be very appealing. It means they don't have to have separate bootstraps for every machine, they don't have to address every different graphics board, every spreadsheet board and so on, like users now have to do with PC ATs in local-area networks [LAN]. While all ATs look different on LANs, all [IBM] 80386s will look the same. That's the kind of standardization we need. SQL, 80386s and LANs are going to be a natural fit," Weber predicts.

He adds that the more he looks at IBM's intentions with Extended Edition, the more impressed he is.

"The integration of data bases across IBM systems, the embedding of SQL calls and the consolidation of SAA are what my clients will be interested in," Weber explains. "IBM learned a valuable lesson from its System/38 experience. People love having something like DB2 built into a system. It gives you a totally new perspective when you think that a data base management system is not a separate application but part of the actual system you're using.

"When all the pieces of the OS/2 Extended Edition come together on IBM's 80386 system, it will take off. Until then, I can't see any reason for using the PS/2 Model 80 except at the computer-aided design level."

The total connectivity package will not happen suddenly. IBM and third-party developers will put much of this SAA strategy into place over several years. Last year, IBM gave itself a five-year development window in which to deliver significant SAA products, though some observers are optimistic that certain SAA links will be present in OS/2 Extended Edition at its debut in 1988.

There will also be a steep price to pay for such expanded connectivity features. Some observers say that even without the separate communications and data base functions the Extended Edition will provide, OS/2 is going to be enormous in size, devouring the average micro's main memory and speed.

To handle these communications features, PCs are going to require heavy data throughput and speed, something the 386-based PS/2 Model 80s will have over the 286 machines. IBM's newest 386 addition, the PS/2 Model 80-311, sprints along at 20 MHz, coming close to the top speed of 25 MHz that high-end 386 machines were designed to handle.

A monster of a machine

It is likely that IBM could introduce an even more powerful 386 system in 1988 or 1989, a machine specifically designed to maneuver powerful SAA programs. Part of that PC system expansion will probably include an increase in on-board main memory to several times the 3M or 4M bytes now available.

These are ambitious connectivity plans that are right in line with IBM's apparent intention to become such an all-encompassing force in the office that any vendor trying to work outside of the IBM fold would be courting disaster.

If some of IBM's short-term plans with its 286- and 386-based systems seem self-defeating and confusing, it is helpful to remember that IBM is one of the few companies that can afford to sacrifice some immediate benefits to keep its much more significant long-range plans on track. Keeping SAA on track. Big Blue has buttressed the SAA effort with its Applications Systems Division, the name IBM has given to its 6,000-employee, $5 billion facility dedicated to making SAA an acronym by which the entire U.S. computer industry eventually lives. ✦

Apple links to IBM, DEC for business market clout

LIVING IN AN IBM world can be profitable if you play by the rules — and Apple Computer, Inc. knows it. Part of Apple's recent revenue surge has come on the back of a well-orchestrated push to give the Macintosh II and Macintosh SE links to the IBM computing environment and, to a lesser extent, the Digital Equipment Corp. VAX/VMS world.

One of today's hottest connectivity products is Tops, a local-area network (LAN) from Berkeley, Calif.-based Tops (formerly Centram Systems West, Inc.). Tops enables Apple Mac, Microsoft Corp. MS-DOS and even Unix-based computers to share disks, files and peripherals. The company also claims that Tops's cross-operating system translation can allow a Macintosh user running Microsoft's Excel data base program to open a Lotus Development Corp. 1-2-3 file located on a remote IBM Personal Computer, alter the file, then store it back into the IBM PC.

In addition to Tops's entry, other network companies such as 3Com Corp. and Ungermann-Bass, Inc., both located in Santa Clara, Calif., are offering links that integrate Macintoshes and IBM PCs on the same LAN so they can share files, printers and electronic mail.

Another vendor, Kinetics, Inc. in Walnut Creek, Calif., has introduced a family of Ethernet products for the Macintoshes. Kinetics says the products enable users to share the Ethernet network and communicate with a variety of non-Apple computers.

Jumping into the fray, Atlanta-based Hayes Microcomputer Products, Inc. added communications software to its V series 2,400 and 9.6K bit/sec. modems to be compatible with Macintoshes.

In addition, even chemical giant Du Pont Co. in New Cumberland, Pa., has come out with a fiber-optic LAN for users of Apple's Appletalk network.

For plugging Macintoshes into larger IBM systems, there are a growing number of micro-to-mainframe link products, such as Macmainframe from Hopkinton, Mass.-based Avatar Technologies, Inc., and Macwindows 3270, a Mac/IBM Systems Network Architecture link from Tri-Data Corp. in Mountain View, Calif.

On the other hand, if you swear only by DEC VAX minis, you need not worry. A number of firms, such as Dove Computer Corp. in Wilmington, N.C., and Odesta Corp. in Northbrook, Ill., are coming out with products that integrate Macintoshes closely into VAX environments. Dove's Fastnet, for example, enables a Mac to become the end node on a VAX network. And Odesta's Helix VMX creates mixed, multiuser Mac and VAX configurations.

Enough said. It seems obvious that both Apple and third-party software developers feel that the time is ripe to get Macintoshes, IBM PCs and DEC systems talking to one another. Connectivity is also something that Apple has to push if it wants to survive what many analysts are now saying is a temporary boom in PC desktop publishing and a temporary Apple lead in PC graphics.

"IBM is trying to close the gap in graphics," says Jim Weber, president of Insight Technology, Inc., headquartered in Piscataway, N.J. Weber explains that although IBM's Presentation Manager, an upgrade of Microsoft's Windows, still falls short of the Mac's graphics features, it is more like the Mac than anything IBM has offered to date.

Jonothan Yarmis, a senior research analyst at the market research firm Gartner Group, Inc. in Stamford, Conn., says that his company is bullish on Apple for the long term, and part of that enthusiasm stems from a series of studies conducted by Gartner on the cost differentials between installations of IBM PCs and Macintoshes.

"We found significant savings in mixed Mac/IBM PC environments over strictly IBM PC installations," Yarmis claims. "Cost savings through reduced training with Macintoshes, as well as the good software being produced or ported to the Mac, are what's going to drive Apple corporate sales.

"But connectivity is also important," Yarmis adds. "It gives that extra incentive for MIS to create mixed Mac/IBM PC environments. MIS can no longer use the lack of networking options as an excuse to exclude Apple on approved-vendor lists," he claims.

Hal D'Algee, a consultant based in Davenport, Iowa, says he thinks Apple connectivity is important because users have been steadily building PC data bases that they now want to share with others.

"The increased connectivity is great," D'Algee says. "But I think the Mac is still pretty expensive for what it can deliver" in the way of business applications.

Weber says that the only time Apple will succeed in the office is when "we see the same applications running in both the Mac and IBM PC environments, completely transparent, with no [file] conversion necessary. But who knows when that will be?

"As for the Macintosh's ease of use," Weber adds, "the Mac will always be easier to learn than most other machines. But you can't do a business macro with a mouse. Apple still has some work to do to overcome its nonbusiness image." — STAN KOLODZIEJ

The Big Ban

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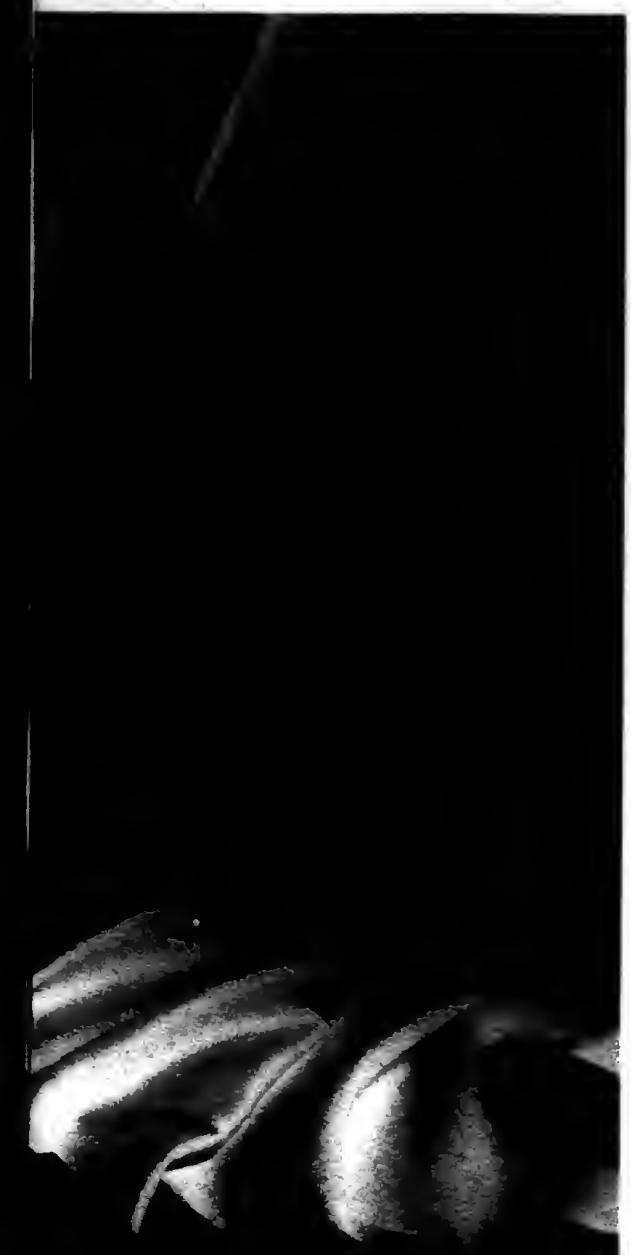

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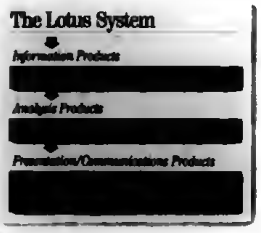

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A cooperative effort

Sharing the processing load

BY ROSS ALTMAN

Cooperative processing is the latest phase in what many see as the continuing decentralization of corporate computing. The use of personal computers and a mainframe to share the processing of production applications can be an attractive approach for both data processing professionals and users, even though some say the technology has yet to reach full maturity.

Cooperative processing technologies bring about the performance advantages of using multiple processors to execute a transaction. MIS not only saves mainframe CPU cycles and improves response time but also helps applications by placing their front ends on PCs.

In addition to improving performance, there is the issue of ownership and control. Some people feel that the users of an application should own both the application and the means by which the application is delivered — namely, the computer. Theoretically, this situation gives the user more control over his application and data.

Users have pushed for decentralized processing. The first implementation of this concept, distributed processing, was based on batch communications between computers. Distributed processing uses minicomputers in dispersed locations, but while it provides some of the advantages of decentralization, it also has certain disadvantages.

In distributed processing, each minicomputer on the network has to have a copy of either the entire data base for the application or a segment of the data base. This data is generally updated and consolidated every night from the mainframe. As a result, the systems' operators can only access data that is current and accurate as of the previous night. This situation is not an ideal one, and, understandably, the implementation rate for distributed applications has slowed considerably during the past few years.

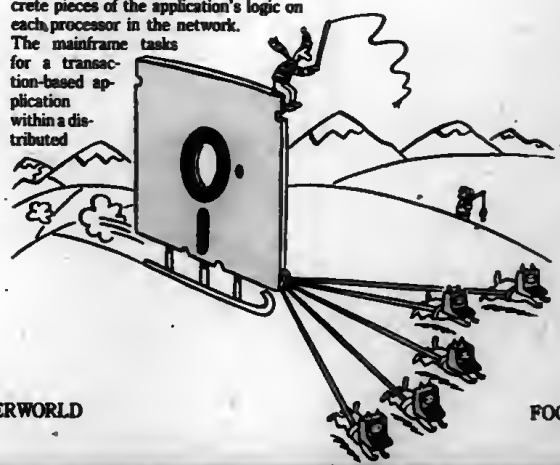
However, the introduction of real-time cooperative processing has caused a resurgence lately in the demand for decentralization. Because cooperative processing eliminates the need for nightly updates of data for each user, systems of dispersed processors can now meet a wider range of application requirements.

Real-time cooperative processing is implemented using two distinct technologies: distributed data and distributed function.

By embedding data management in a distributed data base management system, DP professionals can write programs that execute on PCs and access data wherever it is stored on the network.

If you store the data on multiple PCs, the DBMS will find it. If the data is on the mainframe, the DBMS can locate the information there, too.

A distributed data base system executes discrete pieces of the application's logic on each processor in the network. The mainframe tasks for a transaction-based application within a distributed



MIKE SANTALORE

Altman is director of marketing for Multi Soft, Inc., a software vendor in Edison, N.J. He previously was employed by On-Line Software International, Inc.

data base network include shared communications management, shared data base management and security enforcement. The personal computer tasks in a distributed data base system include shared communications management, shared data base management, security, error processing, Help screen processing, field-level editing, table lookups, transaction logging and printer management.

In the distributed function approach to cooperative processing, a single copy of the data resides on a central mainframe. Applications run on PCs with the PCs communicating with the mainframe whenever they require data access.

The two primary differences between distributed function and distributed data base networks are in the areas of data and communications management.

Cooperative processing implemented through distributed function technology varies from the way it is used in distributed data bases. Tasks are allocated differently between processors. In a distributed function network, the mainframe tasks include shared communications management, data base management and security processing. PCs handle shared communications management, communications management, error processing, Help screen processing, field-level editing, table lookups, transaction logging and printer management.

The two primary differences between distributed function and distributed data base networks are in the areas of data and communications management. In a distributed data base, communications between processors takes place with each data base I/O, and it is implicit to the data I/O process. A certain level of interprocessor communications overhead is always required, and these extra costs are outside a programmer's control. The only way that this overhead can be controlled is through data base design and implementation.

With the distributed function approach, on the other hand, communications is under the explicit control of the programmer, and data base access primarily takes place on the mainframe. This can be a blessing or a curse.

For example, if you are primarily concerned with ad hoc, end-user queries over a cooperative processing network, then it is important that the communications process be transparent to the user. But if you are an analyst or application development manager, you may be concerned with the degree of control that the technology supports, knowing that the automatic features built into a product are sometimes inadequate. Your choices about these technologies may depend on your need to control the system's communications overhead.

There are also other areas in which you may want to determine your needs and priorities before deciding if distributed data base or distributed function technologies are right for you.

It is important to determine if the data base technology used during cooperative processing is compatible with your current data bases. A recent study of large shops, conducted by the Gartner Group, Inc. in Stamford, Conn., indicated that the average shop already has more than two data bases. Because maintaining those existing data base products is resource intensive, you will want to consider your options carefully before acquiring yet another data base.

Another angle to consider is the ability to use cooperative processing in conjunction with existing applications and existing data. With distributed data bases, you will have to copy your existing data into the new data base. However, that step leaves you with two copies of the data to maintain.

An alternative is to rewrite all related applications to use the new distributed data base product. Even fewer MIS managers will be interested in that approach. As a result, distributed data bases will most likely be used for new applications.

The distributed function approach offers a favorable alternative in this area. Because distributed function processing uses your existing data base, it allows you to add cooperative processing programs that access existing data. These programs can be new applications, or they may be add-ons to existing applications. In either case, the general level of communications overhead can be tightly controlled, and you don't have to change any existing data bases or programs.

A security check

In some shops, the resources required to maintain a security system rival the resources spent on data base maintenance. Many organizations have special security requirements and have, therefore, customized existing security packages or have written their own. Under these circumstances, it is important to ask whether the technology selected to implement cooperative processing can work within the existing security environment.

With distributed data base products, you may find that you cannot use your current security system; it was never designed to protect dispersed data located in multiple processors. The distributed function approach, however, should allow you to keep using whatever security package or system you currently have. Because distributed function processing accesses data on the host through host-based programs, it should not affect your current security system.

Another factor to consider is whether your choice of cooperative processing will work with your firm's fourth-generation language or report writer. At this time, a majority of shops use fourth-generation laoguages or report writers to eliminate the need to write a lot of Cobol programs for ad hoc reporting and quick-and-dirty applications.

The acquisition and implementation of fourth-generation language or report writing products represent enormous investments in time and money, especially in organizations that have a commitment to end-user computing. In such shops, the investment in the information center function is often many times higher than the initial cost of a fourth-generation language, and so these shops will often make every effort to maintain compatibility between existing tools and newly acquired software.

A cooperative processing system based on distributed function should not present compatibility problems. With the data stored in your existing data bases, whatever provisions you have for ad hoc queries and reporting should continue to meet your needs.

The same is not true for distributed data bases. Because the data is dispersed over a network, your current fourth-generation language may no longer be capable of meeting users' reporting needs. One solution is to maintain separate data bases: one for on-line use and one for reporting. Another tack is to convert the data and user base to a new reporting system.

The goal of cooperative processing is to provide an efficient system for the execution of transaction-based applications. While the distribution of processing logic over multiple processors can potentially reduce response time per transaction, this response is not guaranteed. It is quite possible that the efficiency gain realized from distributing CPU cycle usage will add to communications overhead. You must weigh the gains and losses in choosing a cooperative processing technology.

In distributed function, the programmer has control over the design of the application. He can place as much or as little processing on the central mainframe as is appropriate, given the performance requirements of the application.

With a distributed data base, controlling application design is more difficult. Once you begin to distribute segments of the data over a network of dispersed processors, you force a certain level of overhead into every transaction. These extra costs are necessary to support the maintenance of the indices and to state information that describes where all of the data resides. As the number of nodes in the data base increases and as data structures become more complex, the funds needed for data base housekeeping may become quite extensive. If this happens, then distributed data bases may not provide a level of performance that is acceptable for high-transaction-rate production applications.

MIS also needs to check if the cooperative processing products available are mature enough to support the firm's production applications. Early in the development of new technologies, products debut that are suited for prototyping and experimentation. It may be some time, however, before the vendors reach the point on the learning curve that allows them to develop and support products robust enough for production applications.

Distributed data bases today represent an early point in the learning curve for this technology. Many studies report that distributed data bases, as they now stand, do not provide the functionality necessary to support production, transaction-based applications. The main problem is the lack of adequate provisions for protecting against concurrent updates of an individual data element. A related problem is the insufficient provision for commit/roll-back processing across the network.

The various implementations of distributed function technology present a different set of concerns. The most well-known product in this area is IBM's Advanced Program-to-Program Communications (APPC). Based on the LU6.2 architecture introduced into IBM's Systems Network Architecture (SNA), APPC allows application programs to be written that communicate through what IBM terms a "protocol boundary," otherwise known as an application program interface for SNA.

The highly publicized cooperative processing solutions cannot do the job yet.

However, APPC has its drawbacks. In the current implementation, APPC only supports communications from CICS 1.7 on the mainframe. APPC will not reportedly be used with applications in other mainframe environments until a future version of VTAM is released, most likely in the fourth quarter of 1988.

Another problem with APPC is the way LU6.2 devices are defined in SNA. At this time, you can define a line to support either an LU6.2 device for cooperative processing or an LU2 device for IBM 3270 emulation. The line cannot support both types of devices concurrently.

No transparent switching

If you want to switch between the two modes, you have few alternatives. You can have the operator switch line definitions in VTAM or you can set up two physical connections and attach your PC to the cables through a switch. Either way, you cannot have an application that consists of some LU6.2/APPC and some 3270 screens because there is no way to switch transparently between the two modes.

This restriction limits your ability to slowly migrate applications from conventional processing into cooperative processing. With APPC, it's all or nothing.

IBM offers no fourth-generation languages on either the mainframe or the PC that support application development with APPC. This situation means that you must use command-level CICS on the mainframe with either the Cobol, PL/I or assembler languages. On the PC, you can use PC assembler, Pascal or C. APPC programming will be time-consuming until programmer productivity tools are available to support APPC.

So, the highly publicized cooperative processing solutions cannot do the job just yet. Distributed data base technology is not mature enough for production applications, and IBM's APPC also lacks support for some important capabilities.

If you are only interested in experimenting with cooperative processing, this condition may not be a problem. But if you have a time-critical application that would benefit from sharing processing between PCs and mainframes, you may need to look elsewhere.

There are some small vendors that are developing tools for cooperative processing, and some of these products are robust enough to handle production applications. This list includes San Jose, Calif.-based Communications Solutions, Inc., which offers Access/SNA APPC; Cary, N.C.-based Tangram Systems Corp., which sells Arbiter; and Edison, N.J.-based Multi Soft, Inc., which produces Super-Link.

In the meantime, keep an eye on developments in this field. Clearly, this is the future technology for commercial data processing, and no one wants to fall too far behind. ◆

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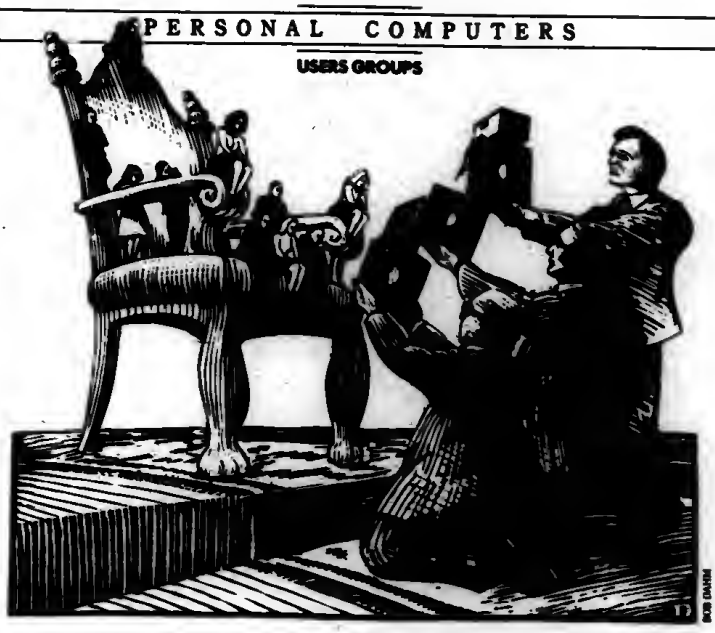

Catering to users groups

BY STAN KOLODZIEJ

In April of this year, software developer On-Line Software International, Inc. suddenly stopped production on Release 2 of its Ramis/PC Workstation data base management system.

Just before this happened, Bob Weber, On-Line's manager of Ramis/PC development, had met with Ramis users at one of the regularly scheduled Ramis user forums. The main topic of discussion was Release 2, a product whose makeup was familiar to many of the users there. When Weber and his colleagues asked the attendees about their impressions of Release 2, however, they got an earful.

"The users made it clear that there were not enough mainframe functions ported to the personal computer version," Weber says. "They wanted a data management facility, pop-up menus and other mainframe features," he explains.

Weber says that Fort Lee, N.J.-based On-Line was about three months shy of completing the Release 2 development life cycle when production stopped. In-house product testing and beta-site testing were two of the remaining steps. "It only put us back one month," Weber says, "but it taught us a valuable lesson — to listen closely to our users groups. I also think it's made our product that much stronger and competitive."

Other PC vendors have learned similar lessons.

Calvin G. Clark, installation support representative at Belmont, Calif.-based Oracle Corp., says

Kolodziej is *Computerworld Focus*'s senior editor.

that Oracle's recent rollout of a PC version of its Oracle relational data base management system resulted from pressure by the firm's users groups. Clark adds that Oracle's announcement of support for high-speed networks is further evidence of the users group's power.

"I was an Oracle user before I joined [the company]," Clark says, "and I can tell you that users groups have a direct line to the president of Oracle. There is direct product influence on the part of users."

Companies like Oracle that have experienced rapid growth from small, regional concerns to major national firms have tended to remain close to their users. These vendors keep alive a custom that goes back to the days when they relied heavily on users' advice to direct product and marketing plans.

"Although many of these companies are now big, they try and keep a grassroots user activity alive because they see it as a quality look at what U.S. corporate users want," explains Ken Wasch, executive director of the Software Publishers Association in Washington, D.C.

"Software publishers recognize that users groups have very skilled people and that these groups are now organized to handle software reviews and discuss product direction," Wasch adds. "I see users groups adding more input into future vendor PC product planning."

> **"[Many companies] try and keep a grassroots user activity alive because they see it as a quality look at what U.S. corporate users want."**
>
> KEN WASCH
> SOFTWARE PUBLISHERS ASSOCIATION

A good example of this users group influence can be seen in the actions of the venerable Washington Apple Pi users group, located in Bethesda, Md. Formed in 1980, Apple Pi has had an impact on Apple Computer, Inc. product direction almost from its start, claims Bernard Urban, Apple Pi cofounder, co-office manager and editor of the users group's journal.

"I think it's funny, this whole thing about the growing influence of users groups," Urban says. "[Apple Pi has] been there from the beginning."

Urban claims that the users group's pressure on Apple to correct the Macintosh II's perceived fan and power supply problems made the firm admit to the faults and look into them.

Ironically, now that Apple is a force in the Fortune 100 computer market, the Washington Apple Pi group as well as other Apple users groups in Berkeley, Calif., and Houston could have a direct influence on how corporate America does its computing — something that was unthinkable two or three years ago.

Urban says that the relationship between Apple and its users groups has always been strong, in part because Steve Wozniak and Steven Jobs, the firm's founders, launched Apple while they were members of an early California users group, the Homebrew Computer Club. Urban says Apple still promotes that kind of users group activism.

For example, Urban points to Applelink, a network set up by Apple and accessible by Apple software developers and users. Applelink remains an open forum for the exchange of ideas.

"Through Applelink, we have access to Apple's top brass," Urban says. "If we send a suggestion to Jean Louis Gassee [Apple's product development administrator], about a certain product, we'll get a reply from him quickly through Applelink. Gassee understands us. He set up a similar group in France."

Other PC users groups (usually dominated by IBM Personal Computer users) tend to be more businesslike and less evangelical in their relationships with vendors. Yet there seems to be a definite movement by PC vendors to get closer to their user bases, and this movement is particularly strong with vendors that are adding PC products to their traditional mainframe product lists.

"Our users groups tend to be built around a particular industry such as banking and manufacturing," explains Dave Leschinsky, PC product marketing manager at McCormack & Dodge Corp. in Natick, Mass. "That's a carryover from mainframe days.

"For our PC Link product, for example, we'll identify clients and companies that are more involved in industry users groups. These are potential beta sites for testing our products. It's also a way for me to identify people with whom I could discuss new product prototypes. I've found that the PC users group folks are generally more interested in getting into a one-on-one relationship with us. That's also something we're now trying to promote," Leschinsky says.

Scott B. Conrad, senior product manager of PC software products at Westwood, Mass.-based Cullinet Software, Inc., says that Cullinet's user base has formed an information center advisory committee that meets regularly and recommends PC product direction for Cullinet and other vendors' products.

Both Conrad and Leschinsky say they must now also begin working with some of the large national PC users groups whose members can provide skill and influence that will be beneficial to hardware and software vendors. Such groups have the expertise and general PC product knowledge that might be lacking in more vendor- or product-specific groups.

A good product review in the publication of such a large PC users group, for example, will do wonders for a small PC software company that cannot muster the same advertising and marketing resources that its larger competitors can.

Testing of all kinds

Jerry Schneider, president of the 5,500-member Capital PC Users Group, Inc. (CPCUG), headquartered in Burke, Va., says his organization is constantly approached by PC vendors for "preproduct testing, postproduct testing, alpha and beta testing and everything in between."

Schneider says such vendors are steered to individual CPCUG members and forewarned about the users group's policy, which cautions against positioning any product review or use that could be construed as a CPCUG product endorsement.

Though Schneider calls CPCUG a regional users group, he adds that many of its members hail from across the U.S. and other countries. Even though CPCUG still considers itself a regional operation, its influence is felt nationwide. As an outspoken critic of software copy protection, for example, Schneider has thrown CPCUG's full weight against the Software Publishers Association and individual PC software vendors to convince them to drop copy protection in site licensing plans.

The pressure has paid off. Almost all U.S. software companies have quietly dropped copy protection. Schneider also takes credit for CPCUG playing a leading role in the recent Lotus Development Corp. decision to remove copy protection from future releases of 1-2-3 and Symphony.

Other users groups lay claim to similar vendor arm-twisting. Jerry McFaul, a computer scientist with the U.S. Geological Survey and the chairman of the Special Interest Group, CD-ROM Applications Technology (SIGCAT), which is made up of 1,000 federal government users of compact disk/read-only memory (CD-ROM) technology, boasts that SIGCAT's influence just might change the complexion of the CD-ROM industry.

"Government business is important to the CD-ROM industry," McFaul explains. "By focusing on a few CD-ROM technologies and indicating to the vendors that they must include those in their bids to be competitive, SIGCAT, in a sense, can create de facto CD-ROM standards that will be carried over into the nongovernment market."

McFaul says, for example, that SIGCAT assisted in pushing CD-ROM vendors to focus on the SIGCAT-approved High Sierra Group file format standard. McFaul also reports that his group nudged vendors to introduce half-height optical disk drives into their PC-based CD-ROM systems.

"The government and CD-ROM are natural allies simply because there is so much data and paper in the government that CD-ROM can handle," McFaul says. "It's a case of a users group — and a government users group, at that — being there first to help set the tone of an industry."

Schneider, like Wasch from the Software Publishers Association, says that the growing influence of users groups on vendors is directly related to the growth of user expertise.

In February, he explains, Microsoft Corp. introduced a network service called Dial for its third-party software developers. A big emphasis of Dial is on Microsoft and IBM's OS/2 operating system. Software developers can use Dial to send suggestions and ideas, which Microsoft says are directed to its software engineering department. Microsoft also guarantees a four-hour response time to questions.

Schneider says a lot of the software developers involved are also PC users and belong to users groups. Schneider thinks there is a good chance that many of the ongoing suggestions from developers and users are going to be incorporated into both the first release and extended release of OS/2 when they are introduced next year.

According to Schneider, "That sort of product discussion and interplay with developers and users didn't exist a few years ago, even at a company like Microsoft," which is known for its close relationship with its users.

Under pressure

Software vendor Lotus also takes its users' suggestions seriously. Bob Clarke, a sales representative in Lotus's Washington, D.C., sales office, claims there were some major enhancements to Lotus's The Application Connection (TAC) microcomputer-to-mainframe link that were directly traceable back to pressure exerted by Lotus users groups.

"I know that many users were requesting that the new version of TAC contain a link to DB2," IBM's mainframe data base management system, Clarke claims. "They wanted it, and they got it. Users groups carry a lot more weight than individual companies," he says.

Jonathan Rotenberg, president and founder of the Boston Computer Society, the august PC users group that can claim such industry leaders as Apple's Gassee, former Lotus Chairman Mitch Kapor and Borland International, Inc.'s President Philippe Kahn among its membership, says its members are the kind of people that others come to for advice.

The result, Rotenberg says, has been a rush of vendors knocking on the Boston Computer Society's doors to have their products evaluated, reviewed and, perhaps, even written up in one of the society's publications.

As with CPCUG's Schneider, Rotenberg says the Boston Computer Society goes to great lengths not to appear to endorse or recommend a product. But Rotenberg says it is the smaller software companies that tend to attach too much weight to favorable Boston Computer Society product reviews. Some of these companies will also go too far to try and use the reviews for marketing leverage.

In these cases, Rotenberg advises that the companies can quote from the product review and nothing else.

But if reviews tend to cluster around only a few influential users groups, the danger looms that groups like the Boston Computer Society will become arrogant about their growing influence on vendors.

"And that would be too bad," Rotenberg says, "because I think if the trust is there between vendors and users groups, then such reviews and product discussions can be a good thing for the industry. It's certainly better than just isolating product development to engineers and marketing people."

On-Line's Weber agrees.

"When I was working at Martin Marietta Data Systems, [the original developer of Ramis], there was little interaction with our user community," Weber says. "Martin Marietta is an aerospace company first, then a software company. It just didn't understand its users, but I'm trying to correct that."

Not all users group influence is plied through formal channels, however. Alan Gross, an executive board member of the New York-based Microcomputer Managers Association (MMA), says that users group interaction with vendors can find expression in more than one way.

"There are the formal channels where the MMA puts forth proposals dealing with such ideas as copy protection and truth in advertising," Gross says. "Then there's the informal, back-room stuff just like politics, where vendors and users meet and discuss products and policies at trade shows and other forums. And you'd be surprised at how important some of those back-room meetings are in making vendor product strategies." ◆

products

TECH TALK

PC technology's voyage to Lilliput

By Michael Tucker

How small can computers get?

That's an important question for computing as a technology and for computer users as a group. If it weren't for the ability of semiconductor makers to squeeze whole subsystems onto single chips, the existence of modern mainframes, much less personal computers, would be impossible.

So what's next?

Conventional semiconductor technology is already impressive. Recently, for instance, IBM researchers revealed that they had successfully constructed transistors that measured one-tenth of a micron in size. With that sort of technology, you could stuff whole mainframes into a PC-size box.

Other reseachers in other laboratories are scoring similar triumphs, particularly in such areas as the etching of silicon and other semiconducting materials. In fact, experimenters are now working on such a small scale that they're beginning to encounter problems arising from quantum effects. These almost magical problems occur at nearly atomic levels and include individual particles that will change position without apparent cause, "solid" matter that will waver in and out of existence and electrons that will suddenly tunnel through a wall of an insulator.

Research triumphs may make molecular-scale computing a reality.

But is this as small as we can go? Well, maybe not.

There is a a vocal minority of theorists who want to do nothing less than build on the molecular level. They envision machines constructed one atom at a time and supercomputers that would fit on a microscope slide with room to spare.

Christopher Fry is a founding member of the Nanotechnology Study Group at MIT in Cambridge, Mass. Fry describes nanotechnology as "the study of molecular engineering and its consequences . . . both as a technology and a science."

The group took its inspiration from a series of lectures delivered by former MIT associate Eric Drexler. Drexler has written a book on nanotechnology called the *Engines of Creation*, which was published in 1986 by Doubleday & Co. in New York.

Drexler's basic thesis, which the MIT study group has elaborated upon, is that the technology by which very small objects — even individual atoms — can be manipulated is coming into being. Biotechnology scientists, after all, are doing molecular-level work when they splice a gene.

That being the case, there is no reason why a researcher could not also use those techniques to construct tiny machines that would operate on a similar scale. In particular, the nanotechnologists envision a "general-purpose assembler," a microscopic industrial robot that would be able to operate in the same fantastically small parameters as a virus does.

Working alone, or better, in gangs, such nanomachines would give designers the power to work with nanometer precision. "A general-purpose assembler," Fry says, "would allow you to construct anything that it is physically possible to construct."

That "anything" includes computers. "It's important to remember that computers are made out of atoms, just like everything else," Fry notes.

Drexler and the other nanotechnologists say they have discussed hypothetical nanocomputers. One of the more promising of these unique machines would use mechanical, rather than electrical or optical, switches. "An electric connector has to have a certain diameter to be able to carry a signal," Fry explains. "It turns out that you can make a rod of, say, carbon atoms, capable of carrying a mechanical signal that is actually smaller than the smallest possible electrical conductor."

The result would be a machine operating on principles not greatly different from those of Charles Babbage's Difference Engine, which might still rival a Cray Research, Inc. machine and

Continued on page 44

Tucker is *Computerworld Focus*'s features editor.

PRODUCT CLOSE-UP

Compaq 386 PCs debut

Compaq Computer Corp. has reaffirmed its role as the personal computer technology leader with the debut of its Deskpro 386/20 and Portable 386 computers.

"Known for pushing the state of the art to new levels, Compaq has implemented a new architecture to improve the overall throughput of the Intel Corp. 80386 processor," explained Aaron Goldberg, vice-president of microcomputer services for International Data Corp. (IDC), a Framingham, Mass., research firm. By doing so, the Houston-based company is telling vendors using the 386 with their existing PC architectures that unless they add value through their engineering, they will not keep up, he said.

The Deskpro 386/20 is the first computer to use the Compaq Advanced Flexible System Architecture. The Flex architecture was designed to alleviate computing bottlenecks by providing separate data paths for memory and peripheral input and ouput. The architecture also uses a memory-caching scheme that enables the Deskpro 386/20 to utilise 32K bytes of static random-access memory (RAM). As a result, the 386/20 can run at a full 20-MHz clock speed on almost all memory cycles, Compaq reports.

Borland takes a swipe at Lotus's 1-2-3 with its Quattro product. Story page 44.

Three models of the Deskpro 386/20, the 60, 130 and 300, come with 1M byte of RAM, a half-height 5¼-in. 1.2M-byte diskette drive, the Compaq Expanded Memory Manager, a disk-caching utility, the Compaq

Continued on page 44

BLUE BEAT

Software push

Deidre Depke

IBM never really took well to software.

Since its inception as a seller of statistical machines, IBM has been known as a hardware company. The majority of the company's research and development dollars has been poured into hardware, resulting in software offerings that are often criticized as inferior. From operating systems to applications software, IBM's products have generally borne a significant amount of user wrath.

But IBM is finally giving software its due. With declining earnings as a major concern, IBM has acknowledged that growth in software sales is key to its long-term profitability and has taken steps to stimulate growth in that product area.

Most prominently, IBM last July formed its Application Systems Division (ASD), which has worldwide responsibility for developing and acquiring application software across the IBM product lines. It will also be the focal point for the company's application software support.

ASD also has responsibility for working with independent software vendors developing application software for IBM systems. That aspect is an important part of this division's work — particularly because IBM has dramatically increased its work with independent software vendors this year. For instance, the company has signed a number of remarketing agreements for vertical market software with leading software firms, notably Dallas-based Hogan Systems, Inc. IBM also inked a joint

Continued on page 47

Borland offers Quattro

Will it loosen Lotus 1-2-3's hold on the market?

Borland International, Inc. in Scotts Valley, Calif., has come out swinging at Lotus Development Corp., a company whose 1-2-3 product has long dominated the personal computer spreadsheet market.

In development for the past three years, Quattro: The Professional Spreadsheet, is being positioned by Borland as a high-powered challenger to 1-2-3. In what Borland claimed was a recent objective benchmark test, Quattro reportedly retrieved, loaded and read spreadsheet files faster than 1-2-3.

Also touting Quattro as a product of the future, Borland said that the spreadsheet, which is scheduled for shipment in the fourth quarter of this year, will run on such major operating systems as Microsoft Corp. MS-DOS, IBM and Microsoft's OS/2, OS/2 with Presentation Manager and OS/2 Extended Edition for Intel Corp. 80286- and 80386-based machines.

Quattro's features are said to include intelligent recalculation, a facility that Borland claims delivers very fast spreadsheet operations; a built-in macro development and debugging environment, written in Borland's Turbo Pascal, for building dedicated applications; and file- and macro-level compatibility with 1-2-3 Release 2.1.

Bypass often-used menus

Borland said that another feature, Shortcut Mode, enables users to bypass a possibly cumbersome series of often-used menus, thereby speeding operation and encouraging greater accuracy.

Quattro has two pluses up front: It is a three-disk program that uses only 384K bytes of random-access memory, and it costs $195.

With Quattro, the company no doubt is hoping to loosen the stranglehold Lotus has on the spreadsheet market, even though Borland's president, Philippe Kahn, claims Quattro is an evolution of 1-2-3 — not a direct competitor.

But gaining any ground at all on Lotus will not be easy. In a 1987 U.S. personal computer spreadsheet business that is expected to reach between $400 million and $450 million, "Lotus probably has about 75% of that market," estimated David Thomas, senior analyst at Hambrecht & Quist, Inc. in New York. "That's a tough one to crack." — STAN KOLODZIEJ

Circle Reader Service Number 159

Compaq

Continued from page 43

Enhanced Keyboard, interfaces for parallel and asynchronous communications, a real-time clock and a socket for either a 20-MHz Intel 80387 or Weitek Corp. coprocessor board with an 80387 socket.

The Model 60 has a half-height 60M-byte fixed-disk drive, four available 8- or 16-bit expansion slots and two 8-bit slots.

Models 130 and 300 contain a full-height 130M-byte and 300M-byte fixed-disk drive, respectively. Both models are said to feature an Enhanced Small Device Interface fixed-disk drive controller, three available 8- or 16-bit expansion slots and two 8-bit slots.

What can IBM do?

"The Deskpro 386/20 offers as much or more functionality than IBM's Personal System/2 Model 80," IDC's Goldberg claimed. "IBM will have to look at adding more features if it wants to be more competitive with Compaq."

The 386/20 is priced at $7,499 for the Model 60, $9,499 for the Model 130 and $12,499 for the Model 300, the vendor said.

The 20-lb Compaq Portable 386 does not use the Flex architecture but has been designed to maximize system performance in memory, data storage, expandability and communications, according to Compaq. The Portable 386, available in two models, comes standard with 1M byte of 32-bit RAM that can be expanded to 10M bytes in the main system unit.

The product also includes a 20-MHz 80386 processor; a 5¼-in. 1.2M-byte diskette drive; high-resolution dual-mode plasma display; full-size, detachable Compaq Portable Enhanced Keyboard; a socket for a 20-MHz 80387 coprocessor; disk-caching software; automatic 110V/220V line selecting feature; asynchronous communications; parallel interface; and real-time clock and calendar, the vendor said.

The Model 40 has a 40M-byte, shock-mounted fixed-disk drive and costs $7,999.

The Model 100 has a 100M-byte shock-mounted fixed-disk drive and is priced at $9,999.

Models of the Portable 386, Deskpro 386/20 as well as the Deskpro 386 that are shipped before January 1988 will include a free copy of Microsoft Corp.'s Windows/386, according to the vendor. — REBECCA HURST

Circle Reader Service Number 161

Theos product targets users sick of OS/2 wait

Now that it is a given that software specifically slanted for IBM's OS/2 operating system will not be appearing for at least a year, the market for interim Intel Corp. 80386 operating systems is starting to get crowded.

One of the latest to sign on is Walnut Creek, Calif.-based Theos Software Corp. The company said it is hoping its Theos 386 operating system, written in the C language, will find a ready market with those users eager to get some multiuser use from 386-based systems now and avoid the wait for OS/2.

Theos is no stranger to the market for alternative multiuser operating systems. These operating systems run on everything from IBM Personal Computer XTs, ATs and compatibles, supermicros and the IBM Personal System/2 Models 50 and 60.

The product was designed, Theos Chairman Timothy Williams explained, to support up to 128 users in the 80386 protected mode. In this mode, Theos 386 can use a memory management scheme that includes virtual demand paging, which is the ability to swap system memory between random-access memory and disk. This feature will reportedly enable Theos 386 to physically address up to 4G bytes of memory with a virtual memory space of 64 terabytes, supporting large applications that go beyond the troublesome 640K-byte Microsoft Corp. MS-DOS program barrier.

The catch is the software; there are not many programs that run under Theos 386 right now. To remedy this situation, Theos is offering its C compiler to serve as a bridge to other operating systems and users. Theos C, for example, includes Unix and MS-DOS source-code compatibility, enabling Unix and MS-DOS programs written in C to be recompiled to run under Theos 386.

The firm also claimed that existing Theos software applications, running under previous versions of the Theos operating system, can be easily ported by software vendors to run under the Theos 386 version.

Theos, along with The Santa Cruz Operation, Inc. with its SCO Xenix 386 operating system and Software Link, Inc. with its PC/MOS, is hoping that more vendors will support these 386-based operating systems. And some vendors are backing them, including Eastlake, Ohio-based Star Gate Technologies, Inc., which supports Theos 386 for its networking scheme.

These 386 companies will need the vendor support because they are racing against time, trying to gain some user and developer market share before OS/2 applications finally come flooding in.

Theos 386 costs $799; Theos C costs $599.

A full development kit consisting of Theos C, Theos Basic and the Script text processor costs $1,599. — STAN KOLODZIEJ

Circle Reader Service Number 160

Tech Talk

Continued from page 43

be hardly larger than a microbe. And the machine would be fast. "Naturally," Fry explains, "mechanical signals travel more slowly than electrical or optical ones. But the device itself would still be so small that you'd have significant advantages in speed."

It's these types of thoughts that caused the nanotechnology group to come together in the first place and that have given its members some restless nights. "One of the main reasons I'm involved with this," Fry says, "is that I'm scared." The group has discussed, for instance, military applications of nanotechnology.

However, Drexler's disciples hope that in the long run, nanotechnology will be more benevolent than otherwise.

The question for the rest of us, though, is whether nanotechnology is possible and when it will make its appearance. We may see results in our lifetimes. "It's hard to say when, but Drexler believes a general-purpose assembler will be possible within 20 years," Fry claims.

Others aren't as optimistic. When Drexler's book was published, reviewers greeted it with caution.

Still, even if the nanotechnologists prove to be poor prophets, their ideas may be impossible to ignore. Other, more conventional theorists are considering molecular computing, if not wholesale molecular economies.

For instance, in the early 1980s, there was a flurry of interest in academic circles in "biochips." The idea was that biochips would be assembled one atom at a time using the same techniques that biotechnologists use to splice genes.

In the U.S., interest in biochips seems to have waned, however, along with the bionics movement in engineering. But in Japan, biochips are still a hot topic. Some U.S. researchers, in fact, have suggested that if such devices are at all possible, they will probably first appear as part of Japan's current efforts to transfer the nation's skills in applied research and development to basic R&D.

But no matter who does it first, researchers are confident that molecular computing can be achieved. In fact, they say, it is already being done — in the human body.

After all, the average DNA molecule is a "computer" in that it manipulates quite a lot of information (faster than most of our computers can), and yet it fits neatly inside a single cell.

"We're not inventing anything totally new," Fry explains. "We are imitating the functionality of, and, potentially, improving on, devices that evolution has already created."

Baytec micro system has mini-like characteristics

A recently introduced turnkey connectivity system, the Allegro 4000 from Baytec, Inc. in Ann Arbor, Mich., is the latest evidence of the rapid transfer of minicomputer technology to microcomputers. The Allegro is a combined file server and communications manager for IBM Personal Computer networks. Allegro 4000 is based on a microprocessor but looks and behaves so much like a mini that it is difficult to tell the difference.

Although best known as a minicomputer vendor, Baytec is now offering the Allegro 4000, a micro-based system designed to fit into a work group or university campus-type situation to provide connectivity, data storage, tape backup and communications facilities between separate PCs, Apple Computer, Inc. Macintoshes and other micros. The company claimed that Allegro 4000 can support up to 56 individual personal computers or fit into a PC network of any size.

Like a PC, the Allegro 4000 is compatible with Microsoft Corp. MS-DOS, yet it provides mini-like storage space — up to 5G bytes of hard-disk storage. It uses a small computer system interface (SCSI), a device typically found in minis and multiuser micros, to provide a data transmission speed of 32M bit/sec. It also supports up to 16 serial printers and two parallel printers.

Continued on page 47

PRODUCT CHECKLIST

Microsoft Corp. has introduced **Version 5.0** of its **Macro Assembler**. The upgraded product is said to support source-level debugging and mixed-language programming.

Version 5.0 supports the Intel Corp. 80386 and 80387 microprocessors. It also features Microsoft MS-DOS interface macros, high-level language interface macros, the ability to assemble using all available personal computer memory and options that allow warning levels and define symbols to be set on the command line. The product also includes such utilities as a linker, an object module library organizer, an applications rebuilder, a header modifier and a cross-referencer.

Microsoft Macro Assembler is priced at $150.

Upgrades from Version 4.0 cost $40 and from earlier versions cost $75.

Microsoft, Box 97107, 16011 N.E. 36th Way, Redmond, Wash. 98073.

Circle Reader Service Number 162

IBM has introduced the **PC Convertible Model 3**, an upgrade to its portable computer line. The Model 3 weighs 12.4 lb, uses 3½-in. diskette drives and is reportedly compatible with IBM's Personal System/2 microcomputers.

The company said that both the backlit and reflective displays on the Model 3 use supertwist technology to produce sharper images and widen the viewing angle.

The static CMOS memory, expandable to 640K bytes, reportedly has a feature that enables the Convertible to be turned off in the middle of an application and restarted later at the same point in the application.

IBM's *PC Convertible Model 3*

An optional internal modem that supports both the IBM and Hayes Microcomputer Products, Inc. command sets is also available.

The IBM PC Convertible Model 3 is priced at $1,695.

An upgrade kit, consisting of a backlit display and an enhanced power supply, for IBM's existing PC Convertible models, is also available for $350, according to the company.

IBM, 900 King St., Rye Brook, N.Y. 10573.

Circle Reader Service Number 163

Hewlett-Packard Co. has introduced the **Portable Vectra CS** and the **Portable Vectra CS Model 20** battery-powered computers.

The two portable computers are based on the Intel Corp. 8086 processor with 640K bytes of random-access memory (RAM), HP said.

Up to 6M bytes of RAM and 4M bytes of RAM can be added to the Portable CS and Model 20, respectively.

The 17.6-lb Portable CS also provides two 1.44M-byte floppy disk drives, while the Model 20 has a 20M-byte hard disk and one 1.44M-byte floppy disk drive. HP claimed that its 3½-in. disk drives are compatible with IBM Personal System/2 disks as well as industry-standard 720K-byte disks.

The company added that the computers' 12-in. LCD is removable, enabling the system to be connected to an external monitor for use as a small-footprint desktop personal computer.

The HP Portable Vectra CS with two floppy drives is $2,495. The HP Portable Vectra CS Model 20 PC, with one hard disk and one floppy disk drive, is priced at $3,595.

HP, 3000 Hanover St., Palo Alto, Calif. 94304.

Circle Reader Service Number 164

Master, a personal computer-based system for the analysis, design and documentation of data base applications, has been announced by **Infodyne, Inc.**

Developed by an Italian company, Gesi, in Rome, Master is said to support all design activities relating to the conceptual, logical and physical model of data and processes in an information system. It produces various levels and documentation, integrates local subschematica into a global design and converts the conceptual entity relationship design into the relational model.

The basic module costs $1,900. Modules for generating the conceptual entity relationship schema of the application, generating data-flow diagrams and producing standard ASCII files with the description of the data base structure cost from $495 to $795.

Infodyne, Suite 200, 227 S. Main St., South Bend, Ind. 46601.

Circle Reader Service Number 165

Forthright Systems, Inc. has announced the **Forthright Real-Time Environmental Display** (FRED), a real-time, high-resolution, graphics-oriented performance measurement tool for IBM MVS/370 and MVS/XA operating systems.

The IBM Personal Computer-based product provides real-time graphics displays from IBM's RMF Monitor II on-line displays. The vendor claimed that the RMF displays are captured by FRED and instantaneously transformed into graphics.

The product includes more than 45 predefined color displays of MVS events and status indicators. It also reportedly features remote-connect capabilities, which give centrally located users the ability to monitor the performance and service levels of remote systems running MVS.

Forthright licenses FRED starting at $5,000.

Forthright Systems, 490 Lakeside Drive, Sunnyvale, Calif. 94086.

Circle Reader Service Number 166

Micro Mart, Inc. has unveiled **MMI-100 Optidriver**, an optical storage subsystem and software device driver for IBM Personal Computers and compatibles.

Micro Mart said its Optidriver enables users to access a write-once, read-many optical disk drive as though it were a Winchester drive.

The company also claimed that users can run most Microsoft Corp. MS-DOS application programs directly from the optical disk drive, have multiple device drivers on the same system and access 200M bytes per side of a cartridge.

The MMI-100 Optidriver costs $6,495 and is available in both an internal version, which fits into an 8-bit slot in the PC, and an external version.

Micro Mart, Suite 109, 8620 N. 22nd Ave., Phoenix, Ariz. 85021.

Circle Reader Service Number 167

Ideassociates' *emulation board*

Ideassociates, Inc., has introduced **Ideacomm 3278/MC**, an IBM 3278/3279 terminal emulation board that reportedly provides personal computer-to-mainframe communications for the IBM Personal System/2 Models 50, 60 and 80.

Ideacomm 3278/MC enables users to choose between two interface options: native Idea mode, which allows file transfer and screen updates, and Digital Communications Associates, Inc. Irma mode, which provides compatibility with PC-to-mainframe link programs written for the Irma interface.

The company added that the product offers an install program with self-diagnostics and self-corrections as well as a user-friendly menu.

The product is also said to have a file transfer program; a hot-key feature enabling users to toggle between Microsoft Corp. MS-DOS and host sessions; and a documented IBM Applications Program Interface.

Ideacomm 3278/MC is priced at $995, the company said.

Ideassociates, 29 Dunham Road, Billerica, Mass. 01821.

Circle Reader Service Number 168

Microtek Lab, Inc. has introduced **MacOCR**, an optical character recognition (OCR) subsystem for Apple Computer, Inc.'s Macintosh.

MacOCR reportedly is capable of reading more than 250 typefaces. The OCR subsystem reads characters ranging in size from six to 12 points as well as mono, proportional and foreign accent characters and some typeset faces.

According to Microtek, MacOCR recognizes the text and then converts it into Apple Macwrite, Microsoft Corp. Word or plain ASCII text format so that the text can be edited or incorporated into word processing software.

The vendor said MacOCR is priced at $895.

Microtek, 16901 S. Western Ave., Gardena, Calif. 90247.

Circle Reader Service Number 169

Michael Obar has his priorities straight.
He reads Computerworld first.

As MIS manager for Ares-Serono, Inc., a Boston-based worldwide manufacturer of pharmaceuticals, Michael Obar has many responsibilities. Sometimes more than the hours of one day allow.

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Michael knows that staying on top of what's happening can mean staying on top — period. That's why reading *Computerworld* every week is a priority for him.

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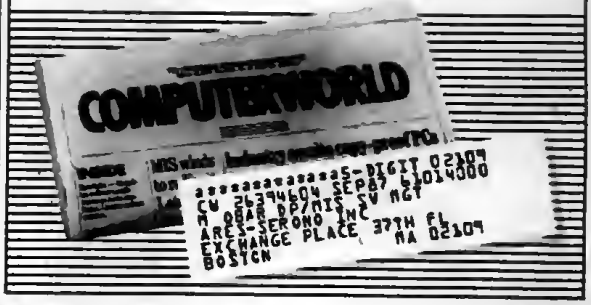

CALENDAR

Nov. 8-14

Data Training Conference & Expo. Anaheim, Calif., Nov. 8-12 — Contact: Julia Stasio, Weingarten Publications, 38 Chauncy St., Boston, Mass. 02111.

Technology and the Future. Calgary, Alberta, Nov. 9 — Contact: Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

The Seybold Executive Forum: Visionary Management and Technology Directions in the Real World. Cambridge, Mass., Nov. 9-11 — Contact: Deborah Hay, Patricia Seybold's Office Computing Group, Suite 612, 148 State St., Boston, Mass. 02109.

The 14th Annual Computer Security Conference. Anaheim, Calif., Nov. 9-11 — Contact: Helen Shimek, Computer Security Institute, 360 Church St., Northboro, Mass. 01532.

Autofact '87 Conference. Detroit, Nov. 9-12 — Contact: Computer and Automated Systems Association of the Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

FMX '87, the International Facilities Management, Engineering & Operations Expo. Chicago, Nov. 9-12 — Contact: Carolyn Downs, Publication Liaison, American Institute of Plant Engineers, Suite 1090, 425 Martingale Road, Schaumburg, Ill. 60173.

National Computer Graphics Association's Mapping & Geographic Information Systems '87 Conference & Exposition. San Diego, Nov. 9-12 — Contact: Bob Cramblitt, Press Office Coordinator, National Computer Graphics Association, Suite 200, 2722 Merrilee Drive, Fairfax, Va. 22031.

Localnet '87. Los Angeles, Nov. 11-13 — Contact: Dawn Lancaster, Online International, Inc., 989 Avenue of the Americas, New York, N.Y. 10018.

Long-Range Information Systems Planning. New York, Nov. 11-13 — Contact: Beth Ranney, Senior Program Director, American Management Association, P.O. 319, Saranac Lake, N.Y. 12983. Also being held Nov. 16-18 in Scottsdale, Ariz. and Dec. 2-4 in Boston.

Building the Information Systems Plan. Lake Buena Vista, Fla., Nov. 12-13 — Contact: Nolan, Norton & Co., One Cranberry Hill, Lexington, Mass. 02173. Also being held Nov. 17-18 in Lexington.

Nov. 15-21

Telecom System Maintenance: Management and Cost Control. Boston, Nov. 16-17 — Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

The IBM Personal System/2 Series and the IBM XT/AT Technology. Washington, D.C., Nov. 16-18 — Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015.

National Data Base and Fourth- and Fifth-Generation Language Symposium. Dallas, Nov. 16-18 — Contact: Digital Consulting, Inc., 6 Windsor St., Andover, Mass. 01810. Also being held Nov. 30 to Dec. 2 in Boston.

Planning and Managing Corporate Networks — An Enterprise Perspective. Orlando, Fla., Nov. 17-18 — Contact: Ashley Pearce, Gartner Group, Inc., P.O. Box 10212, 56 Top Gallant Road, Stamford, Conn. 06904.

Planning and Managing Corporate Networks — An Establishment Perspective. Orlando, Fla., Nov. 19-20 — Contact: Ashley Pearce, Gartner Group, Inc., P.O. Box 10212, 56 Top Gallant Road, Stamford, Conn. 06904.

Data Base: A Builder's Guide. New York, Nov. 17-20 — Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

T1 Networking. Chicago, Nov. 19-20 — Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

Nov. 22-28

The PC as a Programmer/Analyst Workstation. Boston, Nov. 23-24 — Contact: Digital Consulting, Inc., 6 Windsor St., Andover, Mass. 01810.

Nov. 29-Dec. 5

The 7th Annual Optical Information Systems Conference & Exhibition. New York, Dec. 1-3 — Contact: OIS '87, Meckler Corp., Registration Department, 11 Ferry Lane West, Westport, Conn. 06880.

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Blue Beat

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development pact with Lotus Development Corp. to produce a version of 1-2-3 for its 370 machines. It has signed hundreds of software firms under the Industry Marketing Assistance Program to cooperate in marketing software and services. IBM will likely increase those types of arrangements with third parties in 1988.

Based in Milford, Conn., the ASD's software activities will be based in six U.S. laboratories and five laboratories abroad.

In the long term, the division should produce better, more sophisticated, more niche-targeted products for users. But ASD has some challenges it must first address.

Many of those challenges lie in IBM's internal structure. For instance, major IBM-developed software, such as DB2 and IMS, are not under ASD's jurisdiction. IBM's Educational Systems Business Unit works with outside developers, as do some product development groups. And some internal software development, particularly on the communications end, is still being done from hardware divisions.

ASD has made major strides in bringing programs under its control. Industry Marketing Assistance Program participants and value-added resellers now work with ASD. The Cooperative Software Program, announced in June, also falls under the ASD's watch. The program allows IBM to market independent software vendor's software on a nonexclusive basis. In addition, the Vendor Logo Program, which enables IBM to act as sole distributor for PC programs, is run by ASD. Now, sales representatives working with third-party software firms often do so under the aegis of ASD.

Once ASD solves its remaining structural problems, it must get down to the business of developing software.

Clearly, the division will focus on two areas: vertical software and Solutionpacs.

IBM's vertical software offerings have already been beefed up this year. Health care, financial services and the travel industry were just three vertical markets for which the company has announced specialised applications in 1987. Solutionpacs are bundled software and services that have become de rigueur at IBM product announcements.

Both types of products are important to IBM's efforts to penetrate small and medium-size businesses. This market infiltration has become particularly important at the mid-range level, in which near saturation and an increasing proportion of replacement sales among Fortune 2,000 end users has forced Big Blue to redefine its targets to focus more on alternative customers.

Clearly, IBM users will benefit from the company's concentration on software if it manages to produce unique products of increased quality. But it's still unlikely that IBM, with its mainframe-oriented upper management, will ever be known as a premier software firm.

Depke is editor of "IBM Watch," a biweekly newsletter published by Boston-based IDG News Group.

Baytec

Continued from page 44

The Allegro 4000 is being marketed to value-added resellers. A seven-user system with 33M bytes of disk storage and 125M bytes of streaming-tape backup costs $30,000.

The Allegro 4000 is a means of linking disparate micros without investing in the troubles of a PC network. But the product's real importance is in its mini-like characteristics. The SCSI interface, the data-storage capability, the connectivity technology — all of these features are standard in the mini world but wholly unknown in the micro arena. As micros grow in power, we can expect the emergence of more of these downsized products — downsized, that is, in that they run on smaller machines without reducing their functionality.

This occurrence, in turn, could mean that the leadership of the PC software industry may gradually shift away from the vendors who had their start in single-user, stand-alone systems to mini developers who have worked with multiuser systems all along. — MICHAEL TUCKER

Circle Reader Service Number 170

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Call us, toll free, at 1-800-343-6474 if you have a question. Or, forward your inquiries to Lory Zottola, Managing Editor, Computerworld Focus, *375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.*

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A world view

Worldwide PC market forecast, 1984-1993

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OF INTEREST

"When we were formed in 1982, the communication with PC vendors was one way; that is, we chased the vendors. Now, we have 20 different ways we can deal with vendors. They come to us."

JERRY SCHNEIDER
CAPITAL PC USERS GROUP, INC.

See story page 41

next issue

Software stars in *Computerworld Focus*'s December issue. We'll shed some light on the role that schools and the government play in selecting languages and influencing commercial markets. In addition to reviewing project management software and expert systems, we'll check out what IBM's SQL and DB2 really offer users. And, finally, our Special Section for the month highlights the latest trends and products in mainframe software.

Sasquatch in a suit

Thomas Roberts

A true power user is something like a Sasquatch, a creature often talked about but rarely seen.

Just as that legendary snowman hides somewhere in the forests of North America's vast Northwest, so, too, do legions of power users lurk somewhere deep in the corners of U.S. corporations. The power user is often not readily distinguishable from his surroundings. He may look like you, wear the same suit and tie, have the same shoes and facial structure. But put him in front of a computer and all similarities end.

The power user is a storehouse of knowledge, an expert on using a personal computer to get the job done. In the time it takes the average person to build a simple spreadsheet, a power user can download mainframe data, construct a model forecasting company sales in 1991 and produce a desktop-published report that looks as if it came straight from the printing press.

The power user never makes a mistake, never formats the wrong disk. If he loses a file, he has just the right utility program to bring it back. A power user is a superconsumer and implementer of PC hardware and applications software. If he needs a faster hard disk drive, he buys and installs one himself.

His knowledge is both revered and feared by colleagues and peers.

Market research has consistently shown the species to be primarily male. This is a peculiar phenomenon and a sensitive subject. There are many theories explaining the discrepancies between male and female power users, yet none has been proven conclusively.

Born to shop

Another prominent characteristic of the power user is that he will buy virtually anything. The budget for power use is seemingly unlimited. Power users' appetites for new, more technically advanced hardware and software have been shown to be insatiable. Power users will buy almost any product as long as it is more powerful than what they currently own. Then these users will tell their friends. It is this characteristic that endears power users to all marketing and public relations people.

There have been few recorded sightings of this creature. However, one computer company's advertisement recently pictured a fine specimen punishing his data into submission while eating his lunch. The company was even able to capture the thoughts of this particular power user and reproduce them in its advertisement. His musing went something like this: "I'd much rather be here in the corner of my corporation, putting this computer through its paces and eating this bag lunch, than hanging around in some slothful cafeteria with lesser users."

Just like Sasquatch, the power user is something of a solitary soul.

Roberts is an independent consultant and writer based in New York.

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